



# Global Environment Facility

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July 02, 2009

Dear Council Member,

I am writing to notify you that we have today posted on the GEF's website at [www.TheGEF.org](http://www.TheGEF.org), a medium-sized project proposal from UNDP entitled ***Senegal: Innovations in Micro Irrigation for Dryland Farmers under the Regional: SIP PROGRAM: Strategic Investment Program for SLM in Sub-Saharan Africa (SIP)***, to be funded under the GEF Trust Fund (GEFTF).

The project objective is to demonstrate and replicate innovative, indigenous and sustainable small-scale irrigation practices within a context of integrated land use planning.

The project proposal is being posted for your review. We would welcome any comments you may wish to provide by July 17, 2009, in accordance with the new procedures approved by the Council. You may send your comments to [gcoordination@TheGEF.org](mailto:gcoordination@TheGEF.org).

If you do not have access to the Web, you may request the local field office of the World Bank or UNDP to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

A handwritten signature in black ink, appearing to read 'Barbut', enclosed in a simple rectangular box.

Monique Barbut  
Chief Executive Officer and Chairperson

Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee



# REQUEST FOR CEO ENDORSEMENT/APPROVAL

PROJECT TYPE: Medium-sized Project  
THE GEF TRUST FUND

Submission Date: 8 April 2009  
Re-submission Date: 15 June 2009  
Re-submission Date: 26 June 2009

## PART I: PROJECT IDENTIFICATION

GEFSEC PROJECT ID: 3386

GEF AGENCY PROJECT ID: PIMS No. 2120

COUNTRY(IES): Senegal

PROJECT TITLE: SIP: Innovations in Micro-Irrigation for Dryland Farmers

GEF AGENCY(IES): UNDP

OTHER EXECUTING PARTNERS:

GEF FOCAL AREAS: Land Degradation

GEF-4 STRATEGIC PROGRAM(S): LD-SP1-Agriculture

NAME OF PARENT PROGRAM/UMBRELLA PROJECT: Strategic Investment Program for Sustainable Land Management in Sub-Saharan Africa (SIP/SLM)

INDICATIVE CALENDAR	
Milestones	Expected Dates
Work Program (for FSP)	Jun 2007 (SIP)
CEO Endorsement/Approval	June 2009
GEF Agency Approval	July 2009
Implementation Start	August 2009
Mid-term Review	February 2011
Implementation Completion	August 2012

### A. PROJECT FRAMEWORK

**Goal:** To contribute to sustainable land management in order to maintain and improve ecosystem health, stability, integrity, functions and services, and at the same time support sustainable livelihoods in Senegal.

**Objective:** To demonstrate and replicate innovative, indigenous and sustainable small-scale irrigation practices within a context of integrated land use planning.

Project Components	Investment, TA, or STA**	Expected Outcomes	Expected Outputs	Indicative GEF Financing*		Indicative Cofinancing		Total (\$)
				(\$)	%	(\$)	%	
<b>1. Capacity building</b>	TA STA	<p>1.1 Enhanced awareness and knowledge about sustainable irrigation practices at national level</p> <p>1.2 Institutional capacities for SLM strengthened in the Bakel department</p> <p>1.3 Potential for terrestrial carbon sequestration from SLM practices is better understood and documented, and contributes to int'l negotiations</p>	<p>Updated, comprehensive, and accessible national database of successful micro irrigation practices in the sub-region</p> <p>Best SLM and small-scale irrigation practices inform 10 community land-use plans</p> <p>Public &amp; private sector stakeholders in 10 rural districts in Bakel are familiar with small-scale irrigation within ILUP context</p> <p>200 local leaders are trained in SLM and small scale irrigation</p> <p>Monitoring methodologies are available for carbon sequestration evaluation and monitoring (e.g. following Carbon measurement project under TerrAfrica).</p> <p>Baseline data and analysis of carbon sequestration potential in small-scale irrigation systems in a typical Sahelian setting available.</p>	229,000	44	295,000	56	524,000

Project Components	Investment, TA, or STA**	Expected Outcomes	Expected Outputs	Indicative GEF Financing*		Indicative Co-financing*		Total (\$)
				(\$)	%	(\$)	%	
<b>2. Investment in micro-irrigation and SLM</b>	Investment TA	2.1 Models of sustainable micro irrigation systems known and implemented in Bakel department	<p>Small-scale irrigation best practices piloted in 10 rural districts of the Bakel department leading to improved water-use efficiency, reduced soil erosion in micro-catchments and improvements of livelihoods as measured against baseline (baseline to be developed)</p> <p>Crop productivity in pilot sites is 30% higher than reference sites.</p> <p>Water efficiency increase in pilot sites (yield / water outage)</p> <p>Some 4.000 ha. of land is brought under sustainable land management.</p>	490,000	62	296,000	38	786,000
<b>3. Learning, evaluation and adaptive management</b>	TA	<p>3.1 Project management is efficient</p> <p>3.2 Enhanced awareness at national and regional levels of the potential of micro irrigation practices to generate global environmental and socio-economic benefits</p>	<p>Efficient management and monitoring and evaluation system integrating lessons learned (GEF= US\$ 91,000)</p> <p>A communication and dissemination strategy is implemented using a set of field-tested knowledge-transfer methods and tools for up-scaling micro and small scale SLM practices throughout Senegal and sub-region (GEF= US\$ 100,000)</p>	198,431	48	219,000	52	417,431
<b>Total project costs</b>				<b>917,431</b>	<b>53</b>	<b>810,000</b>	<b>47</b>	<b>1,727,431</b>

\* Percentage is the share of GEF and co-financing respectively to the total amount for the component.

\*\* TA = Technical Assistance; STA = Scientific and Technical Assistance.

**B. SOURCES OF CONFIRMED CO-FINANCING** (including co-financing for project preparation)

<i>Name of co-financier (source)</i>	<i>Classification</i>	<i>Type</i>	<i>Amount (\$)</i>	<i>% *</i>
ANCAR	Government of Senegal	in-kind	200,000	24 %
CILSS	Multilateral agency	in-kind	150,000	18 %
Union of Horticultural Producers	Beneficiaries	in-kind	95,000	11 %
ENDA (**)	NGO [implementing agency]	grant (8,5%), in-kind (92,5%)	355,000	41 %
CSE	NGO	in-kind	50,000	6 %
<b>Total Co-financing</b>			850,000	100 %

\* Percentage of each co-financier's contribution at CEO endorsement to total co-financing.

\*\* This includes contribution of US\$ 40,000 for project preparation.

**C. FINANCING PLAN SUMMARY FOR THE PROJECT (\$)**

	<i>Project Preparation</i>	<i>Project</i>	<i>Agency Fee</i>	<i>Total at CEO Endorsement</i>	<i>For the record: Total at PIF</i>
GEF	0	917,431	82,569	1,000,000	1,000,000
Co-financing	40,000	810,000		850,000	1,040,000
<b>Total</b>	40,000	1,727,431	82,569	1,850,000	2,040,000

**Note:** The total at CEO endorsement stage is slightly lower than at PIF due to some recent revisions from the co-financing partners, in order to show a realistic budget. Please also note that the organization ENDA (which is a key co-financing partner and the project implementing agency) contributes to more than 50% of the overall project management costs and will make other contribution as necessary during implementation as well as to expand project's impacts through their widespread presence in the field.

**D. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

<i>Component</i>	<i>Estimated person weeks</i>	<i>GEF (\$)</i>	<i>Other sources (\$)</i>	<i>Project total (\$)</i>
<i>Local consultants*</i>	75	25,000	50,000	75,000
<i>International consultants*</i>	0	0	0	0
<b>Total</b>	75	25,000	50,000	75,000

\* Detailed information regarding the consultants provided in Annex C.

**E. PROJECT MANAGEMENT BUDGET/COST**

<i>Cost Items</i>	<i>Total Estimated person weeks</i>	<i>GEF (\$)</i>	<i>Other sources (\$)</i>	<i>Project total (\$)</i>
<i>Local consultants*</i>	150	52,500	52,500	105,000
<i>International consultants*</i>	0	0	0	0
<i>Office facilities, equipment, vehicles and communications**</i>		14,300	41,300	55,600
<i>Travel**</i>		10,000	24,500	34,500
<i>Miscellaneous</i>		7,000	5,000	12,000
<b>Total</b>	150	83,800	123,300	207,100

\* Detailed information regarding the consultants in Annex C.

\*\* This comprises office rental, utilities, communications, furniture, ITC equipments, et al.



F. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? yes no

**G. DESCRIBE THE BUDGETED M&E PLAN:**

1. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and UNDP's Country Office (UNDP-CO) with support from UNDP's Environment and Energy (EEG) team at regional level (which is based precisely in Dakar). The project's results Framework matrix in Annex 1 provides *performance* and *impact* indicators for project implementation along with their corresponding *means of verification*. These will form the basis on which the project's Monitoring and Evaluation system will be built.
2. The following sections outline the principal components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. The project's Monitoring and Evaluation Plan will be discussed and finalized at the Project's Inception Workshop following a collective fine-tuning of indicators, means of verification, and the full definition of project staff's M&E responsibilities.

**MONITORING AND REPORTING**

Project Inception Phase

3. A Project Inception Workshop (IW) will be conducted with the project team, relevant government counterparts, co-financing partners, the UNDP-CO and a representation from the UNDP-GEF Regional Coordinating Unit.
4. A fundamental objective of this Inception Workshop will be to assist the project team to understand and take ownership of the project's goals and objectives, as well as finalize preparation of the project's first annual work plan on the basis of the project's result framework matrix. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.
5. Additionally, the purpose and objective of the IW will be to: (i) introduce project staff with the UNDP-GEF *expanded team* which will support the project during its implementation, namely the CO and the Regional Coordinating Unit staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO staff *vis-à-vis* the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget rephasings.
6. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be examined in order to clarify, for all, each party's responsibilities during the project's implementation phase.
7. An Inception Report will be produced immediately after the IW to compile the results and agreements reached, including: (i) refining of roles and responsibilities of the project team, the implementing agency and the Steering Committee; (ii) the core M&E elements such as indicators and means of verification, including particularly guidance for the study that will define baseline and quantitative indicators to measure impact on Component 2; and (iii) the annual work plan for the first year.

Monitoring responsibilities and events

8. A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report.

Such a schedule will include: (i) tentative time frames for Tripartite Reviews, Steering Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities.

9. *Day to day monitoring of implementation progress* will be the responsibility of the Project Manager based on the project's Annual Work Plan and its indicators. The Project Team will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.
10. The Project Manager and UNDP's Regional Advisor for SLM will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the Inception Workshop with support from UNDP-CO and assisted by the UNDP's Regional Coordinating Unit. Targets and indicators will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan.
11. Measurement of impact indicators related to global benefits will occur according to the schedules defined in the Inception Workshop. The measurement of indicators will be undertaken through subcontracts or retainers with relevant institutions, through specific studies that are to form part of the projects activities (e.g. measurement carbon benefits from best SLM practices) or periodic sampling such as with sedimentation. This exercise will be carry out in coordination with the regional SIP monitoring and evaluation team and indicators.
12. *Periodic monitoring of implementation progress* will be undertaken by the UNDP-CO through quarterly meetings with the project, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.
13. UNDP's CO will conduct yearly visits to field sites to assess project progress. A Field Visit Report will be prepared by the CO and circulated, no less than one month after the visit, to the project team, to all SC members, and to UNDP-GEF team.
14. *Annual Monitoring* will occur through the *Tripartite Review (TPR)*. This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to Tripartite Review (TPR) at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The Government will prepare an Annual Project Report (APR) and submit it to UNDP-CO and the UNDP-GEF regional office at least two weeks prior to the TPR for review and comments.
15. The APR will be used as one of the basic documents for discussions in the TPR meeting. The project proponent will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The Government also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary. The TPR has the authority to suspend disbursement if project performance benchmarks are not met.

### **Terminal Tripartite Review (TTR)**

16. The terminal tripartite review is held in the last month of project operations. The Government is responsible for preparing the Terminal Report and submitting it to UNDP's CO and RCU. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The terminal tripartite review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental goals. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation or formulation.

### Project Monitoring Reporting

17. The Project Coordinator will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Among them, items (a) through (d) are mandatory and strictly related to monitoring, while (e) and (f) are optional and depend on the type of project and its implementation.

**(a) Inception Report (IR)**

18. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed Annual Work Plan, divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include tentative dates of specific field visits, support missions from UNDP's CO, as well as time-frames for meetings of the project's decision making structures. The report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame.

19. The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project-related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

20. When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, UNDP's CO and RCU will be given the opportunity to review the document.

**(b) Annual Project Report (APR)**

21. The APR is a UNDP requirement and part of UNDP's CO oversight, monitoring and project management. It is a self-assessment report by project management to the CO and provides input to the country office reporting process and the ROAR, as well as forming a key input to the Tripartite Project Review. An APR will be prepared on an annual basis prior to the Tripartite Project Review, to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

22. The format of the APR is flexible but should include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- AWP, CAE and other expenditure reports (ERP generated)
- Lessons learned
- Clear recommendations for addressing key problems in lack of progress or to improve implementation

**(c) Quarterly Progress Reports**

23. The project team will provide UNDP-CO quarterly with short reports outlining main updates in project progress.

**(d) Project Terminal Report**

24. During the last three months of the project, the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met or not achieved, structures and systems implemented, etc. It will represent the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

**(e) Technical and thematic reports** (project specific - optional)

25. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. Technical Reports may be prepared by external consultants and should be specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.
26. As and when called for by UNDP, the project team will prepare specific thematic reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered during implementation. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

**(f) Project Publications** (project specific- optional)

27. Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific texts or practitioner's documents. It is anticipated that the project will produce a number of these documents as part of its activities.

**INDEPENDENT EVALUATION**

32. The project will be subjected to at least two independent external evaluations as follows: a Mid-Term Review and a Final Evaluation.
33. **Mid-Term Review (MTR).** An independent Mid-Term Review will take place around mid of project implementation. It will determine progress made towards the achievement of outcomes and will identify course of corrections, if needed. The MTR will assess as follows: (i) effectiveness, efficiency and timeliness of project implementation; (ii) issues requiring decisions and actions; and (iii) initial lessons learned. This review will provide recommendations for enhanced implementation during the remainder of the project. The organization, terms of reference and timing of the MTR will be prepared by the project team and cleared by UNDP (CO and RCU).
34. **Final Evaluation.** An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities and policy mainstreaming. The Terms of Reference for this evaluation will be prepared by the project team and UNDP's CO, based on guidance from UNDP's RCU.

**AUDIT CLAUSE**

35. The Government will provide UNDP's Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of GEF and UNDP funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

**3. LEARNING AND KNOWLEDGE SHARING**

36. The project has an intrinsic feature of producing and disseminating knowledge and best practices on SLM. This will be conducted through existing information sharing networks and forums and other means as identified in the



course of implementation. In addition, the project will participate in, share results with the TerrAfrica partnership.

37. The project will also participate, as relevant and appropriate, in UNDP/GEF sponsored networks and events. The project will identify and participate, as appropriate, in technical (SLM practitioners), scientific, policy and/or any other networks, which may benefit the project implementation through lessons learned.
38. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects, whether in Senegal or in other countries of the region facing similar challenges. The identification and analysis of lessons learned is an ongoing process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP/GEF shall assist the project team in the categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities. ENDA updated database will play a major role in results dissemination.

#### **4. MONITORING AND EVALUATION WORK PLAN AND CORRESPONDING BUDGET**

39. A tentative work plan and budget on Monitoring and Evaluation (M&E) activities is compiled in the table that follows:

### M&E Work Plan and Budget

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding time from project team and UNDP staff</i>	Time frame
Inception Workshop (IW)	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP CO / RCU</li> </ul>	5,000	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP CO</li> </ul>	None	Immediately following IW
Definition of baseline and quantitative indicators to assess impact of Component 2	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP CO</li> </ul>	Indicative cost: 5,000	Within first 4 months, and before Component 2 is implemented.
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> <li>▪ Project Coordinator will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members</li> </ul>	To be finalized in Inception Phase and Workshop. Indicative cost: US\$ 4,000	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> <li>▪ Oversight by Project GEF Technical Advisor and Project Coordinator</li> <li>▪ Measurements by regional field officers and local IAs</li> </ul>	To be determined as part of the Annual Work Plan's preparation. Indicative cost: 6,000 (average US\$ 2,000/year)	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP-CO</li> </ul>	None	Annually
TPR and TPR report	<ul style="list-style-type: none"> <li>▪ Government</li> <li>▪ Project team</li> <li>▪ UNDP CO (RCU to review)</li> </ul>	None	Every year, upon receipt of APR
Steering Committee Meetings	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP CO</li> </ul>	None	Following Project IW and subsequently at least once a year
Periodic status reports	<ul style="list-style-type: none"> <li>▪ Project team</li> </ul>	None	To be determined by Project team and UNDP CO
Mid-Term Review	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP CO / RCU</li> </ul>	10,000	mid-term of implementation
Final External Evaluation	<ul style="list-style-type: none"> <li>▪ Project team,</li> <li>▪ UNDP's CO and RCU</li> </ul>	20,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> <li>▪ External Consultant</li> </ul>	None	At least one month before the end of the project
Audit	<ul style="list-style-type: none"> <li>▪ UNDP-CO</li> <li>▪ Project team</li> </ul>	3,000 (average \$1000 per year)	Yearly
Field visits for M&E	<ul style="list-style-type: none"> <li>▪ Government</li> <li>▪ Project team</li> <li>▪ UNDP CO / RCU</li> </ul>	9,000 (UNDP travel costs are excluded - IA fee)	Yearly
<b>TOTAL COST</b>		<b>US\$ 62,000</b>	

## **PART II: PROJECT JUSTIFICATION**

### **A. STATE THE ISSUE, HOW THE PROJECT SEEKS TO ADDRESS IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED**

40. **The main issues:** Throughout Africa, but particularly in dryland areas, access to adequate quantity and quality of water is the single greatest constraint on both development and habitat protection, and the efficient use of water resources is key to both economic progress and environmental quality. The link between economic progress and environmental quality in Africa's drylands is rooted in the multifaceted land-use strategies employed by rural residents. In drylands, natural areas (which contain much important local biodiversity and are an integral part of the natural landscape) are exposed to potentially high levels of mismanaged exploitation, either through conversion to unsustainable agricultural production or through the over-harvesting of available resources. Past efforts to address the management of water resources in dryland areas in Africa have a largely negative legacy. Large state-sponsored irrigation schemes have met with environmental and social problems. However, small-scale irrigation schemes in these areas respond better to the needs of farmers by complementing their other activities, such as rain-fed cropping and animal husbandry, rather than conflicting with them, as well as being more adequate for ecosystem health.
41. The Bakel Region, situated in the Senegal River Valley, confronts one of the most potentially destabilizing natural resource challenges facing dryland areas today – the need for effective strategies and methods to improve the management of scarce water resources. Local production systems combine irrigated agriculture, rain-fed cultivation and pastoral activities. Small scale irrigation schemes have the potential of responding to the needs of farmers by complementing their other productive activities. However, in the Senegal River Valley there has been a disproportionate dependence on large-scale water management strategies that have exacerbated competition for land and that frequently are environmentally and economically inappropriate. To date, fragmented objectives and sectoral approaches have addressed irrigated agriculture in isolation rather than embedded within the context of more effective community-based land use planning and decentralized management of natural resources. Natural Resource Management (NRM) is poorly considered in Local Development Plans, while communes and local communities lack adapted tools to protect, develop and manage their ecosystems.
42. **The Project:** The project will inform and train farmers and NRM stakeholders on sustainable land and water management, implementing pilot demonstrations in the Bakel department. It will gather, systematize, and disseminate information on small-scale dryland irrigation systems and related SLM best practices. The Bakel territorial department consists of 5 municipalities ("arrondissements") and 13 rural districts ("comunautés rurales"), with a population of about 200,000 inhabitants. Dissemination will be a core practice, reaching out to rural communities elsewhere in Senegal to improve their capacity to manage scarce and fragile resources, particularly water and soil. The project is premised on the contention that the use of innovative water management practices, particularly small-scale irrigation activities, embedded within the context of more effective community-based land use planning and decentralization, will provide results that overcome the difficulties outlined above and do so in for the long term. Furthermore, the use of such practices to inform the development of national resource management strategies in Senegal will prove invaluable to other African nations where small-scale irrigation can contribute to improved integrated ecosystem management, such as enhancing the management of production landscapes and augmenting productivity so to take pressure from ecologically sensitive areas. This could result in the future execution of similar projects in other countries. Some successful projects in micro irrigation are already available in Senegal and will provide the basis for a quick start; they include: CECI/PAEP micro-irrigation kit, the African Market Garden (from a GEF project that was coordinated by ICRISAT), ENDA-lead land use planning experiment in Sebikotane, and the PAPIL experiment.
43. The **goal** of the project is to improve the livelihoods of the inhabitants in the Sahel by implementing a bottom-up initiative to promote self-sustained land and water management practices in a typical dryland setting. Through up-scaled implementation of pilot knowledge-transfer initiatives of successful methods for micro irrigation, this project seeks to prevent land degradation, promote environmentally sustainable irrigation practices, and strengthen the irrigated land component of the rural production system so as to relieve the pressure on rain-fed

agricultural and pastoral lands and natural areas, and ensure ecosystem health, stability and integrity. Compared to the baseline large-scale public schemes, controlled and managed by the regional irrigation management authority, small-scale irrigation ventures initiated and managed by local farmers have the economic advantage of requiring smaller investment per unit of cropped area, are often financed using locally-mobilized resources, and can more readily adjust to changes in production factors and fluctuations in commodity markets.

44. In order to achieve this, the project will test and disseminate innovative approaches to micro-irrigation in the Sahel. Furthermore, the project will support the mainstreaming of SLM considerations into national resource management and agricultural production strategies in Senegal. The project has significant up-scaling and replication potential in other areas in the Sahel where irrigated agriculture is practiced or pursued. GEF/SIP resources, via this project, will be used to support targeted investments aimed at: (i) creating the conditions/foundations to allow Senegal to progressively adopt a more cross-sectoral and programmatic approach to SLM, and (ii) supporting on-the-ground interventions aiming at demonstrating and upscaling SLM in the sahelian agro-ecological zone.
45. The project will be implemented by ENDA, a very experienced NGO from Senegal that is part of the LEAD network. ENDA has extensive experience in SLM, rural development and environmental protection, as well as a presence in the Bakel department, so the Government endorsed the NGO-executing mechanism for this project, since this is the most cost-effective means and the one most likely to succeed in both mobilizing farmers and disseminating best micro-irrigation and SLM practices.
46. **Global Environmental Benefits Expected.** Successful implementation of this project will promote the ecological and productive sustainability of drylands, building a productive system that is more sustainable and consistent with the ecological health of drylands. The main global environmental benefit will be to improving water-use efficiency and reducing soil erosion in micro-catchments under small-scale irrigation. Thus the project will provide an environmentally sound irrigation alternative to large-scale irrigation practices, which are often promoted at the expense of accelerated land degradation and waste use of scarce water resources in marginal agricultural areas.
47. Under Component 2, the project will support pilot micro-irrigation initiatives that improve land and soil productivity as well as food security. This will feed into a national model for irrigation in drylands that proves more environmentally sound than current practices. In addition, the project will disseminate lessons learnt and will compile *best practices* that link irrigation and SLM. The project will thus develop environmentally sound production systems in the drylands of Senegal that respond to the urgent livelihoods needs of the population while reducing pressure on some lands that have ecological value. The practices to be experimented in the Bakel department and its rural districts will provide national governmental and non-governmental stakeholders with a tested model for SLM and micro-irrigation planning, ready for scaling up in future interventions elsewhere.
48. Finally, the project will help developing a monitoring methodology and a baseline for Carbon sequestration. This will start building a system for monitoring the potential benefits of carbon sequestration in dryland regions by small-scale irrigation and SLM practices. This outcome will be done in concert with the GEF's Carbon Benefits Project, which aims at providing modeling, measurement and monitoring tools for Carbon (assessing stocks, sequestration and emissions-reduction). This will serve to link SLM practices locally and nationally with Carbon assessments.

## **B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL AND/OR REGIONAL PRIORITIES/PLANS**

49. The project has been designed in line with Senegal's National Action Plan to Combat Desertification (NAP/CD) and the new country partnership framework to combat desertification and poverty. The project will promote agricultural and irrigation practices that build upon local knowledge and capacity to create viable, locally-managed production systems nested within a diverse patchwork of land types. This vision is in concert with Senegal's objectives as outlined in its NAP/CD and NEAP (National Environmental Action Plan). While project efforts will focus on pilot activities in the Bakel Region, the proposed database of innovative small-scale

irrigation practices and the results of field testing in Bakel will assist natural resources planning and management agencies through Senegal and even perhaps across West Africa, notably in gathering and disseminating information related to irrigation production systems that fit squarely within integrated ecosystem management initiatives. In so doing, the project will address one of the most significant barriers to effective implementation of the NAP/CD – the paucity of instructive examples of innovative, community-based water and drylands management strategies available to the typical resource user in rural Senegal. The national government is committed to scaling up the best results of the project by lifting policy barriers that hamper private investment in micro irrigation. The project complies also with the National Adaptation Plan for Climate change (NAPA, 2006) since micro irrigation is an option for adaptation. Senegal is a priority country under the TerrAfrica Partnership (2005) and has been included in the Strategic Investment Plan (SIP), under which this project is submitted.

50. The project is supportive of UNDP objectives in Senegal for environmental and sustainable development goals. The database, information networking, and national policy dialogue components of the project comply with UNDP's goal to build local and national capacities for sustainable development and with the UNDAF 2007-2011 strategic axe that is to "Create wealth, fight hunger, and ensure social protection and sustainable development".
51. The proposed project will coordinate closely with the NCSA project, which conducted a systemic evaluation and analysis of capacity needs and constraints experienced by Senegal in its efforts to meet its commitments regarding global environmental management as set forth in the Rio conventions and related international instruments. Targeted capacity building interventions in the proposed project will use indicators, outcomes and other elements that were developed in the NCSA process.

#### **C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND STRATEGIC PROGRAMS:**

52. The proposed project is consistent with the priorities of GEF Operational Program 15 (Sustainable Land Management) and will contribute to GEF-4 Strategic Objectives 2 and 4, which focus on SLM up-scaling and mainstreaming. The project will promote sustainable land management in drylands through improving and adapting micro and small-scale irrigation strategies in order to create long-term global environmental benefits within the context of agricultural and pastoral development. It will simultaneously contribute to protect ecosystem services, improve local livelihoods, and adaptation to climate change. It is also in line with MDGs 1 and 7.
53. This project is part of the GEF's Strategic Investment Program (SIP) for SLM in Sub-Saharan Africa and will contribute to the SIP's Program Goal, namely improving natural resource-based livelihoods in Sub-Saharan Africa by reducing land degradation. In doing so, this operation will also contribute to the NEPAD/CAADP's goal of improving agriculture productivity while scaling-up SLM, and to the NEPAD/EAP's objectives of program area 1 (degradation).
54. Senegal, which is member of the TerrAfrica Partnership, is one of the sub-Saharan countries included in the first phase of the SIP. This project clearly contributes to the overall SIP Program Goal, as mentioned above. This project will contribute to SIP 2007-2010 Program's objective: "Stakeholders in countries design, implement and manage suitable SLM policies, strategies and on-the-ground investments that are aligned against national priorities and SIP priorities". In particular the proposed project will contribute to SIP Intermediate Results 1 and 4. This will be accomplished by supporting Senegal in adopting a more programmatic approach to SLM by addressing some of the weaknesses in the enabling environment that hinder SLM adoption and replication and in applying sustainable practices that increase land productivity while securing ecosystem services in selected priority areas.
55. Moving towards a programmatic approach to SLM investments in Senegal is also in line with the objectives of the **TerrAfrica Partnership** and will facilitate harmonization of activities and a more strategic targeting of planned activities, not only with the GEF but in the broader donor community. This will entail: (i) coordinating efforts at the political, strategic, technical, and program levels; (ii) developing and consolidating activities that

support SLM; (iii) increasing the quality and quantity of contributions and exchanges of knowledge, data, and expertise; and (iv) mobilizing and channeling financial resources more efficiently.

56. The project, for its subcomponent on Carbon sequestration methodologies and baseline, will liaise with the recent GEF **Carbon Benefits Project** (CBP). The CBP aims at developing modeling, measurement and monitoring tools for Carbon sequestration and emissions-reduction. It will be implemented by UNEP and the World Bank and its goal is to precisely support GEF projects, such as the current one, with tools and protocols for better baselines and assessments around Carbon. The liaison with the CBP will thus equip the project with the means to assess Carbon dimensions of SLM interventions.

#### **D. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:**

57. The GEF/SIP is well placed to catalyze a shift toward a programmatic approach on SLM. The proposed project will benefit, complement and upscale lessons learned, best practices and SLM mainstreaming and institutional capacity-building activities pursued under other projects, such as GEF-supported Integrated Ecosystem Management (PGIES) and Groundnut Basin Soil Management and Regeneration projects (PROGERT) in Senegal. PGIES and PROGERT, which are under implementation, are working to strengthen the overall enabling environment for mainstreaming SLM into rural production systems through the removal of institutional, technical and organizational barriers. This project will add micro-irrigation and ILUP as key options for farmer-level SLM action. This will complement the community-based climate change initiatives under the DFID-supported project "Building Capacity for Climate Change Adaptation in Malawi and Senegal", which is implemented by ENDA in the Bakel region.
58. Different coordination mechanisms will be used to ensure complementarity, coherence and absence of duplication between different GEF and national program working on land degradation. UNDP and ENDA (the implementing partner) will participate to the NAP National committee, GEF focal point meetings, CIP/TerrAfrica and SIP working team. PROGERT and PGIES representatives will work closely with the project Project Management Unit. In fact, ENDA has wide experience and participates in various SLM and sustainable rural development networks, in Senegal, West Africa and globally alike. At the local level, coordination committee between different initiatives will be established under the leadership of the local farmers organisations (e.g. Union des producteurs horticoles de Bakel). The involvement of decentralization institutions like the Regional Council and the communes will guarantee the coordination among regional stakeholders and the mainstreaming of lessons learned in the ongoing planning process for Local Development Plans. At the sub-regional level, the partnership with the CILSS will be ensure the coordination with other West African countries micro irrigation initiatives and results.
59. This project will contribute to the Country's Investment Framework (CIF) for SLM by offering well informed alternatives and opportunities for investments that fight land degradation. The CIF will define commonly agreed targets, benchmarks and indicators, and would be an important tool to streamline coordination among partners and initiatives.
60. This project will be link up to TerrAfrica through the NGO's/civil society framework currently in development. This is in recognition of the fact that of all the conventions stemming from the UN Conference on Environment and Development (UNCED), the Convention on Desertification is the one which gives the greatest importance to the activities of local communities, community organizations, and NGOs. The convention treats them as central to action programs to fight desertification, both nationally and regionally. NGOs are treated as full partners by states, both to elaborate action programs and to mobilize the necessary financial resources for their implementation. UNDP is assisting the network of NGOs in Africa to elaborate a Program of Work that builds on the comparative advantage of its members to strengthen its role in providing an "on the ground implementation partner" to TerrAfrica. Based on the current TerrAfrica Business Plan, the Civil Society program will be a "nested logframe" that will explain how the civil society internalizes and advances the relevant objectives of the initiative, either as a partner or a beneficiary. Under this spirit the organization ENDA was selected by Government to implement this project.

**E. DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING**

61. **Without GEF:** Numerous programs exist for watershed management and irrigation in Senegal, but few take due consideration of SLM or have been able to prevent desertification or conserve ecosystem health. In addition, they do not serve to inform policies, and the knowledge and information that are gained from successful activities remain too localized and poorly institutionalized.
62. **With GEF:** Integrated land and water conservation activities, including small-scale irrigation, are incremental actions that would not otherwise be undertaken under existing conditions, nor would they be shared between sites as well as among stakeholders for the benefit of global environmental values and to inform policies. The proposed GEF alternative offers a conceptual and practical shift in the way that dryland agriculture and watershed management is planned, implemented and appropriated by institutions (national, regional and local). In addition, with this GEF project, global and local benefits will be monitored and lessons learned will be shared. That will contribute to accelerate the rate of investment to fight land degradation.

**F. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED, AND OUTLINE RISK MANAGEMENT MEASURES**

63. Three inter-related risks have been identified: (i) stakeholder participation; (ii) institutional and technical capacity; and (iii) the policy framework. Their description and the proposed risk management measures are compiled in the table that follows:

Risks	Measures proposed
1) Stakeholder participation: Some stakeholders may disregard the advantages of micro irrigation and continue to support large-scale irrigation strategies, as they offer a higher degree of bureaucratic control and greater financial incentives for some public and private sector entities. Furthermore, local stakeholders may be reluctant to participate in project activities because historically they have been excluded from an active role in irrigation projects and policies.	The project will address this risk through policy dialogue activities, as well as through the public awareness campaign on the advantages of micro irrigation using participatory strategies and approaches; this will contribute to leverage more financial resource to encourage farmers involvement in micro irrigation and NRM best practices.
2) Institutional and technical capacity: The institutional and technical capacity to implement micro irrigation initiatives is low in Senegal.	A primary focus of the project is to identify key constraints to best-fit practices and knowledge-transfer methods at the outset of the project and to build capacities throughout the life of the project. Besides, the project is meant to be implemented with the direct support of an organization (ENDDA) that has expertise in the domain and the intervention site.
3) Policy framework: There is a weak and inadequate policy framework for promoting micro irrigation and community-based land use planning.	This risk will be mitigated by project activities focused on policy and regulatory dialogues and efforts to mainstream SLM into national development and planning frameworks.

**G. DESCRIPTION OF THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT**

64. The project design is considered cost-effective because it relies on the strengths of NGOs and communities to apply best practices at the local level, and develop mechanisms for replication and up-scaling to the national level. The project will keep administrative costs as low as possible, and will ensure that all UNDP requirements and procedures for project management, fiduciary responsibility and independent oversight are met. Co-financing arrangements with ongoing projects will also help to share and lower management costs.

### **PART III: INSTITUTIONAL COORDINATION AND SUPPORT**

#### **A. INSTITUTIONAL COORDINATION**

65. The GEF implementation agency for the project will be the UNDP Country Office based in Dakar. The project will be executed under NGO Execution modality, following procedures in accordance with GEF guidelines. The institutional coordination of this project will be assured by the Direction de l'Environnement et des Etablissements Classés (DEEC) while its operational implementation will be done by ENDA, a non-governmental organization with wide experience in SLM and sustainable development in West Africa and in Senegal. The project's execution will follow the TerrAfrica platform's principles, notably by ensuring that the project helps coordinating SLM stakeholders and that SLM interventions serve to enhance national planning around SLM. The project will be also in coordination with the World Bank's SIP in Senegal, which is being built up.

#### **B. PROJECT IMPLEMENTATION ARRANGEMENT:**

66. The project will be implemented through the **NGO execution modality**. UNDP has ascertained that the proposed non-governmental organization, namely ENDA, has the capacity and experience to execute this project. Project management will thus be the responsibility of ENDA and broadly of the LEAD/ENDA partnership. ENDA is an international NGO working in Natural Resource Management for more than 30 years in Senegal and LEAD (Leadership for Environment and Development) is a global network of individual and NGOs that are promoting sustainable development. ENDA currently coordinates the LEAD Network for the Francophone Africa region. The Government, in its endorsement letter, agrees with this operational modality. UNDP will provide technical assistance and will ensure monitoring and evaluation jointly with ENDA.
67. A Project Steering Committee will be created, with oversight and coordination responsibilities. The Steering Committee will be formed principally of representatives from Government, as well as from the implementing agency (LEAD/ENDA), from co-financing partners, from UNDP and, as relevant, from NGOs and organizations of beneficiaries. The Steering Committee will provide oversight to ENDA, and their implementation partners; will facilitate the coordination of activities among project partners and with outside institutions, and will manage the monitoring and evaluation of the project, including review of annual progress reports. ENDA will put in place a Project Management Unit in Dakar with a Project Manager, and a financial assistant; a Chief Technical adviser located in the Bakel area will ensure management and technical assistance for the field activities (investments, social mobilization, training activities, local planning).
68. The World Bank-supported ANCAR project will provide local farmers with technical assistance, training, and follow-up for the trials. The AFDB-supported PAPIL project will support in the case studies and lessons learned to be investigated, and investments in dams to secure water for irrigation. Collaboration with the French Development Agency-supported program to decentralization and local development will facilitate the integration of the local community based land use plans in the local development plans. The hydro agricultural project of Bakel/SAED, funded by the Kuwaiti Fund, will also complete the local investments and technical assistance framework at community-level. The project will complement the efforts of a regional project on Climate Change Adaptation local strategies (funded by DFID) implemented by ENDA in the Bakel region, in providing opportunities to implement community Adaptation Plans. The CSE partner (Centre de Suivi Écologique) will provide maps, based on satellite imagery, as planning tools for the baseline analysis, the local planning activities and the ecological monitoring and evaluation. This Center is also experimented for land base carbon estimation. The CILSS will help to collect regional experience and to disseminate the results.




**PART IV: EXPLAIN THE ALIGNMENT OF PROJECT DESIGN WITH THE ORIGINAL PIF:**

69. The project design has followed the framework and guidance that was set out in the PIF. Only two relevant, yet non-substantial changes have been conducted, as follows: (i) components have been merged to reduce their number from 6 (at PIF level) to 3 (at ProDoc level) in order to ease implementation and M&E; and (ii) a carbon measurement activity has been included, in order to help developing the climate change mitigation of good SLM practices and enhance the capacities of the country to participate in ongoing debates and negotiations around carbon emissions and sinks.
70. Co-financing arrangements have been confirmed and new co-financing letters have been requested in early 2009 in order to ensure that support for the project proposal remains as originally stated.

**PART V: AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	Date (Month, day, Year)	Project Contact Person	Telephone	Email Address
Andrew Hudson UNDP-GEF Officer-in-Charge		06/26/09	Josep A. Gari Regional Technical Advisor UNDP - Regional Bureau for West and Central Africa Dakar, SENEGAL	+221 338690639	josep.gari@undp.org

## ANNEX A: PROJECT RESULTS FRAMEWORK

Project Strategy	Objectively verifiable indicators			Sources of verification	Assumptions
	Indicator	Baseline value	Target value and date		
<b>Long-term goal:</b> To contribute to sustainable land management in order to maintain and improve ecosystem health, stability, integrity, functions and services, and at the same time support sustainable livelihoods in Senegal.					
<b>Project objective:</b> To demonstrate and replicate innovative, indigenous and sustainable small-scale irrigation practices within a context of integrated land use planning.	Hectare of land brought under sustainable land management.	Zero	An estimated 4,000 ha. of land brought under SLM by end of project	Project M&E reports	Government agencies and other stakeholders will not disregard the advantages of small-scale irrigation. Farmers find financial resources
	Number of individual farmers either become newly involved with sustainable small-scale irrigation or adopt improved practices into their small-scale irrigation systems.	Zero	At least 400 farmers (in 10 rural districts) in Bakel Dept. by year 3		
<b>COMPONENT 1: CAPACITY BUILDING</b>					
<b>Outcome 1.1</b> Enhanced awareness and knowledge about sustainable irrigation practices at national level	A computerized database of successful small-scale irrigation initiatives in arid regions worldwide, including information on model irrigators for successful initiative in Senegal.	No data base	Data base available by end of first year of project.	Project annual report; Community-based land use plans	Detailed and analytical information is available in the country
	Number of community based integrated land use plans in the selected sites.	To be determined after the project's baseline studies	At least 10 community-based plans integrate best SLM and/or small-irrigation practices		
<b>Outcome 1.2</b> Institutional capacities for SLM strengthened in the Bakel department	Nb of trained leaders and local SLM stakeholders	Few leaders aware for SLM	At least 200 leaders/local stakeholders are trained	Project annual report; Institutional & political review of the irrigation sector; Beneficiaries' surveys	
	Government policies adopted that provide an enabling environment for a viable, sustainable small-scale irrigation sector	To be determined with the policy review	At least one government policy incorporates revisions related to sustainable small scale irrigation by year 3		
<b>Outcome 1.3</b> Potential for Carbon sequestration from SLM is better understood and documented, and contributes to int'l negotiations	Carbon sequestration methodologies	No assessment & methodology available or done for Carbon sequestration by ILUP	At least one methodology is developed at national/local level and one Carbon assessment is done and used for international negotiation	Studies and technical assistance on carbon sequestration	

Project Strategy	Objectively verifiable indicators			Sources of verification	Assumptions
	Indicator	Baseline value	Target value and date		
<b>COMPONENT 2: INVESTMENTS IN MICRO IRRIGATION</b>					
<b>Outcome 2</b> Models of sustainable micro irrigation systems are implemented in the Bakel department	Number of farmers participating in pilot field practices/investments on micro-irrigation	No fields test installed;	At least 400 new units are installed in three years	Project annual report	Conflicts among farmers from competition over lands benefitting from small-scale irrigation activities are under control
	Crop productivity increase in pilot sites	baseline to be defined and assessed at project's onset	At least 30% crop productivity increase in pilot sites	Beneficiaries' surveys	
	Water efficiency increase in pilot sites (yield / water outage)		[water efficiency increase's target to be defined at project onset]	Field assessments	
<b>COMPONENT 3: LEARNING, EVALUATION AND ADAPTATIVE MANAGEMENT</b>					
<b>Outcome 3.1</b> Project management is efficient	Project delivery rate		Project management delivery rate averages 70% per year	Project annual report  Government and UNDP reports	Projects partners are fully involved an can play their role
<b>Outcome 3.2</b> Enhanced awareness at national and regional levels of the potential of micro-irrigation practices to generate global environmental and socio-economic benefits	A set of field-tested knowledge-transfer methods and tools for up-scaling micro and small scale SLM practices throughout Senegal and sub region  Number of stakeholders in the Bakel region participating in knowledge-transfer efforts	Few tools available  Zero	At least four major publications on new methods, tools and/or best practices by end of the project  At least 50 farmers participating in disseminating activities and/or field trips at the end of the project	Project's publications  Field trip and project reports	

**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF)

Project was reviewed by GEFSEC on 30<sup>th</sup> April. The only suggestion made was to "include more quantifiable output indicators, especially for component 2". The IA concurs with this idea, yet wishes to mention that this matter will be better dealt at project onset, when baseline and indicators for activities under component 2 should be specified by the project team in place, with advice from UNDP. Nevertheless, the following actions have been taken to respond to GEFSEC's request:

- A new indicator has been included, namely: "Crop productivity in pilot sites is 30% higher than reference sites". This has been included in both the Project Framework (Table A) and the Project Results Framework (Annex A), as well as accordingly in the ProDoc.
- An additional indicator has been included: "Water efficiency increase in pilot sites (yield / water outage)", whose target value will be defined at project's onset.
- An instruction to define baseline and quantitative indicators for component 2 at project's onset has been made. This will start with a specific discussion at the project's Inception Workshop, to be followed by an assignment to realize it. Accordingly, the CEO document requests that, at the inception workshop, when the M&E system is reviewed, this will include "particularly guidance for the study that will define baseline and quantitative indicators to measure impact on Component 2" (par. 7). In addition, the M&E Work Plan and Budget (par. 39) has added this task.

Finally, the IA wishes to note that, under Component 1, significant work will be done to elaborate monitoring methodologies for Carbon sequestration, as well as to assessing Carbon sequestration potential in small-scale irrigation systems in a typical Sahelian setting. This will be first and foremost applied to the pilot sites where Component 2 will operate. Therefore, the project is meant to demonstrate, quantitatively, the Carbon performance of small-scale irrigation initiatives, which indicates environmental benefits in terms of both ecosystem performance and climate change mitigation roles.

**ANNEX C: CONSULTANTS TO BE HIRED FOR THE PROJECT**

<i>Position Titles</i>	<i>\$/ person week</i>	<i>Estimated person weeks</i>	<i>Tasks to be performed</i>
<b>For Project Management</b>			
<i>Local (GEF: 50% - ENDA: 50%)</i>			
Project Manager	700	150	Implementation of the project, including the mobilization of all project inputs, supervision over project staff, consultants and subcontractors. See ProDoc (section IV-3) for Terms of Reference.
<b>For Technical Assistance</b>			
<i>Local (estimated share: GEF:25% - ENDA: 50%)</i>			
Data base / web specialists	1,000	25	Data base development and update
SLM training specialist	1,000	15	Develop training modules in ILUP and support SLM training activities (training of trainers <i>et al.</i> )
Policy specialist	1,000	10	Develop position papers
SLM specialists	1,000	25	Studies, compilation of lessons learnt and documentation

**ANNEX D: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS**

Section not relevant because no preparation fund was requested from the GEF. The project documentation was prepared in country by governmental and non-governmental experts, with UNDP support.

**ANNEX E: CALENDAR OF EXPECTED REFLOWS**

Section not relevant because the project doesn't include a "Non-Grant" instrument.



**UNDP Project Document**  
**UNDP-GEF Medium-Size Project (MSP)**

**Government of Senegal**  
**United Nations Development Program**

**LEAD/FA – ENDA**

( Leadership for Environment and Development / Francophone Africa –  
Environmental Development Action )

**PIMS No 2120: SIP - Innovations in Micro Irrigation for Dryland Farmers**

Brief description

This project was designed to address a crucial natural resource management challenge facing the world today: the need for effective strategies and methods to help communities in dryland areas to improve their management of scarce water resources. Throughout Africa, and particularly in dryland areas, access to adequate quantity and quality of water is among the greatest constraints to both development and habitat protection. The efficient use of scarce water resources is therefore key to both economic progress and environmental quality. This project will support capacity-building, pilot investments and dissemination activities around micro-irrigation and sustainable land management (SLM), in an integrated way.

The objective of the project is "to contribute to sustainable land management in order to maintain and improve ecosystem health, stability, integrity, functions and services, and at the same time support sustainable livelihoods in Senegal". The project is structured in 3 components, as follows: (i) capacity-building, including the set up of a micro-irrigation database, dissemination of best practices for micro-irrigation and SLM, and training of local leaders; (ii) investments in micro-irrigation in relation to SLM, in 10 rural districts of Bakel territory; and (iii) learning, evaluation and adaptive management. The project will be implemented through the NGO execution modality: the proposed implementing agency is ENDA, which is part of the broad LEAD partnership and which has extensive experience in sustainable rural development.

The Bakel territory, in the Senegal River valley, was selected for the pilot SLM and micro-irrigation program (component 2) because this area is renowned for the mentioned challenges in drylands. Furthermore, there are already experiences in environment and sustainable rural development on which the project will build. These pilot activities are designed to gather, systematize, analyze, and test small-scale dryland irrigation systems, and to disseminate this information to rural communities elsewhere in Senegal, enabling them to improve their capacity to manage scarce resources.



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### APPENDICES (See attached files)

- Approved MSP PIF (Appendix 1)
- Letters of endorsement and of co-financing (Appendices 2 and 3)
- Draft Terms of Reference for key project staff (Appendix 4)
- Summary of M&E Work Plan and Budget (Appendix 4)
- Incremental Cost Matrix (Appendix 4)
- Note on the carbon sequestration potential of Bakel area (Appendix 4)

## Acronyms

CAADP	NEPAD's Comprehensive Africa Agricultural Development Programme
CBD	Convention on Biological Diversity
CCD	Convention to Combat Desertification
CILSS	Interstate Permanent Committee for Drought Control in the Sahel
CONSERE	Higher Council for Environment and Natural Resources ( <i>Conseil Supérieur de l'Environnement et des Ressources Naturelles</i> )
CSE	Centre de Suivi Ecologique
ECOWAS	Economic Comity of West African States
ENDA-TM	Environmental Development Action in the Third World
GEF	Global Environment Facility
GoS	Government of Senegal
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
Lead International/FA	Leadership for Environment and Development International Francophone Africa
NAPA	National Action Plan for Adaptation
NAPBC	National Action Plan for Biodiversity Conservation ( <i>Plan National d'Action pour la Conservation de la Biodiversité</i> )
NAPCD	National Action Plan to Combat Desertification ( <i>Plan d'Action National pour la Lutte Contre la Désertification</i> )
NCSA	National Capacity Assessment for
NEAP	National Environmental Action Plan ( <i>Plan National d'Action pour l'Environnement</i> )
PAPIL	Local Small Irrigation Support Project (Projet d'appui à la petite irrigation locale)
PROGERT	French acronym for Groundnut Basin Soil Management and Regeneration
RIOD	NGOs Network to combat desertification ( <i>Réseau des ONGs de lutte contre la Désertification</i> )
SAED	Society for the Management and Exploitation of Soils of the Senegal River Delta and the Senegal and Faleme River Valleys ( <i>Société d'aménagement et d'exploitation des terres du Delta du Fleuve Sénégal et des vallées du Fleuve Sénégal et de la Falémé</i> )
SPA	Senegal Protected Areas (GEF project "Integrated Ecosystem Management in Four Representative Landscapes of Senegal "or PGIES in French)
UNDP	United Nations Development Programme

## **SECTION I: ELABORATION OF THE NARRATIVE**

### **1.- Situation Analysis**

#### *Background*

1. Throughout Africa, but particularly in dryland areas, access to adequate quantity and quality of water is the single greatest constraint on both development and habitat protection, and the efficient use of water resources is key to both economic progress and environmental quality. The link between economic progress and environmental quality in Africa's drylands is rooted in the multifaceted land-use strategies employed by rural residents. In drylands, natural areas (which contain much important local biodiversity and are an integral part of the natural landscape) are exposed to potentially high levels of mismanaged exploitation, either through conversion to unsustainable agricultural production or through the over-harvesting of available resources.

2. Past efforts to address the management of water resources in dryland areas in Africa have a largely negative legacy. Large state-sponsored irrigation schemes have met with environmental and social problems. However, small-scale irrigation schemes in these areas respond better to the needs of farmers by complementing their other activities, such as rain-fed cropping and animal husbandry, rather than conflicting with them, as well as being more adequate for ecosystem health.

3. In dryland regions, small-scale irrigation schemes respond to the needs of farmers by complementing their other activities, such as rain-fed cropping and animal husbandry, rather than conflicting with them, as is often the case with larger state-sponsored irrigation schemes. Compared to large-scale public schemes, small-scale irrigation ventures initiated and managed by local farmers also have the economic advantage of a considerably smaller investment per unit of cropped area (thanks to close adaptation to the site conditions), of being financed by locally mobilized resources instead of relying on uncertain public assistance, and of having the flexibility to rapidly adjust to changes in production factors and fluctuations in commodity markets. Small-scale irrigation also has the ecological advantage of requiring less external inputs and chemicals, able to be more strategically spaced in the landscape so as to match land suitability and functionality considerations, able to be flexible from year to year and match fluctuations in climate or land productivity, and thereby minimize any negative impacts on the ecosystem health.

4. The Bakel Region, situated in the Senegal River Valley, confronts one of the most potentially destabilizing natural resource challenges facing dryland areas today – the need for effective strategies and methods to improve the management of scarce water resources. Local production systems combine irrigated agriculture, rain-fed cultivation and pastoral activities. Small scale irrigation schemes have the potential of responding to the needs of farmers by complementing their other productive activities. However, in the Senegal River Valley there has been a disproportionate dependence on large-scale water management strategies that have

exacerbated competition for land and that frequently are environmentally and economically inappropriate. To date, fragmented objectives and sectoral approaches have addressed irrigated agriculture in isolation rather than embedded within the context of more effective community-based land use planning and decentralized management of natural resources. Natural Resource Management (NRM) is poorly considered in Local Development Plans, while communes and local communities lack adapted tools to protect, develop and manage their ecosystems.

### Land degradation, desertification and irrigation in Senegal

5. Senegal is a tropical country with a **semi-arid climate** classified as "soudano-sahelien". The climate is defined by two distinct seasons: a rainy season from June to September, and a dry season the rest of the year. There is a large variation between precipitation rates in the South (1000 mm/year) and the North (300 mm/year), and the majority of the country, including the Bakel region, receives less than 500 mm/year. Although these are the climatic norms, a generally drier climate, with larger fluctuations, has predominated during a long period of dry years and desertification that began in 1970. The regions of Senegal most affected by during this period have been the sylvopastoral zones of the Senegal, Falémé and Ferlo river valleys, including the Bakel region. Repeated droughts and widespread desertification have led to a drop in agricultural production, the loss of dryland biodiversity, and an ongoing inability to provide adequate food in these and other regions of the country. These factors, in turn, have led to intense poverty and the migration and displacement of population groups away from these areas.

6. In response to these problems, Senegal has attempted to stabilize water resources for agricultural production through **large-scale irrigation** development and government intervention aimed at producing cash crops for export or cereals and grains for national food security. With significant international donor support, Senegal has constructed many medium- and large-scale public irrigation works. These costly irrigation projects have not increased crop production to the extent expected, and have come at a high price in terms of economics, the environment, and local traditions. Most dam projects have had significant cost overruns, high construction costs per hectare, and costly ongoing operation and maintenance expenses. Reservoirs created by dams have flooded forests and displaced villagers. Dams and diversions, by disrupting river flow and preventing annual floods downstream, have decimated fish populations and aquatic ecosystems. Herders, fishermen, and flood-recession farmers whose livelihoods depended on these seasonal floods have lost their traditional ways of life. Moreover, these publicly funded irrigation schemes have encouraged wasteful water practices by those with access to the riches.

7. In the **Bakel region**, dam construction has had severe consequences for local populations. The Manantali Dam, a joint project of Mali, Mauritania, and Senegal completed in the late 1980s, displaced 12,000 people and destroyed 120 km<sup>2</sup> of forest adjacent to the Senegal River as its reservoir filled. Forests downstream of the dams have been damaged by the depletion of groundwater aquifers resulting from suppression of the river's seasonal flood cycle. The construction of irrigation networks proved to be much more expensive than originally planned, and brought far less land under irrigation than expected. Moreover, for peasant families in the region, the inputs needed for irrigation farming (e.g., pumps and diesel to run the pumps) have proven to be prohibitively expensive. The traditional flood recession agriculture of the region's farmers has been greatly compromised by the replacement of the river's annual flood with an

artificial two-week flood. Family farmers whose fields were once regularly flooded now must pump water from the river over great distances and at high cost. As a result, many once productive lands are now farmed unsustainably, leading to eventual desertification and abandonment for new lands. The change in hydrology has also negatively affected the fishermen and livestock ranchers of the region, whose livelihoods are equally dependent on seasonal flooding of the river. An unexpected consequence of the Manantali Dam has been the infestation of the Senegal river valley with water-borne diseases, due to the proliferation of aquatic nuisance plants (mainly *Typha australis*), which provide habitat for the vectors (mosquitoes and snails) of water-borne diseases. Stories like that of the Manantali Dam are heard again and again in African countries where large-scale irrigation projects have been constructed. In light of these facts, there is a great need for public and institutional support of sustainable drylands agriculture on a smaller scale, with local consensus and input.

8. The physical potential for **small-scale irrigation** varies enormously, but is of particular relevance for arid, semi-arid and dry sub-humid areas, and is arguably greatest where shallow aquifers underlie flat land, as is the case in the Bakel region, and several hundred thousand hectares in West Africa alone. That irrigation is practiced by independent farmers at a small scale does not, however, make it simple and automatically sustainable. Small-scale irrigation is subject to many complex interactions, some of which lie beyond a farmer's control. Commonly cited examples are fluctuations in the input and product markets, the country's agricultural development policies, and the accessibility, whether customary or defined by modern law, to land and water. These structural impediments are the barriers the project seeks to identify and remove. Other forces, acting at scales below these macro-level factors, also influence the irrigation management strategy that best suits the characteristics of the site and the requirements of the crop or crops a farmer wants to grow. Successful small-scale irrigators have learned to juggle these micro-forces in a manner that maximizes the potential of their enterprise and contributes substantially to their household economy. However, without an over-arching concern on integrating environmental sustainability, there is no guarantee that the few successful cases will be replicated in such a fashion as to promote ecosystem health, integrity and its sustained functions and services over the long term. The project seeks to identify such best practices, enhance them through integration of sustainable land management principles, and result in valuable demonstrations that can be disseminated.

9. Although a comprehensive accessible database of successful strategies for environmentally sustainable small-scale irrigation does not exist, a well-developed knowledge base of **experimentation and innovation in water development and management** does exist in the form of isolated examples from around the world. Innovative farming communities and individuals are continually forging and perfecting water management strategies, largely refined from indigenous practices, which improve the performance of the three pillars of the rural agricultural economy: rain-fed, irrigated and pastoral systems. Information about these innovations, technical or institutional, is an important resource to tap into in devising methods for communities in the drylands to better cope with the pressures desertification places on their ability to feed themselves. There is very little experience and even less understanding of how best to gather and disseminate this information in a manner that stimulates and supports innovative community-based land and water management projects. This lack of experience in propagating or upscaling isolated examples of innovative water management, indeed the lack of

even a formal strategy for such an information exchange, is one of the most significant barriers to effective implementation of plans to combat land degradation and desertification.

10. Other programs to combat desertification and promote **watershed management** are underway in Senegal and West Africa. At the regional and continent-wide level, the Africa Water Resources Management Initiative, the Soil Fertility Initiative (SFI), and the Network for the Integrated Management of International River, Lakes and Hydro-geological Basins in Africa, all support integrated watershed management and prevention of land degradation. However, small-scale irrigation does not receive significant attention or support in these programs, and even less from national programs and agencies within Senegal, so that concerted and coherent national programs to promote small-scale irrigation do not yet exist. In general, and despite its potential, small-scale irrigation has received little assistance from donors and other development agencies, and instead, most assistance has been delivered on a scattered and ad hoc basis by NGOs.

11. As one means of heightening the visibility of the project and of disseminating lessons learned to end-users who will make direct and coordinated use of them, the proposed project will provide outreach to communities participating in the existing UNDP-GEF Full Project “Integrated Ecosystem Management in Four Representative Landscapes of Senegal” (SPA). The project team has already consulted with SPA managers to identify target communities with socioeconomic and ecological factors that parallel the Bakel region. For example, in the Niokolo Koba park area, also a dryland agricultural area, small-scale irrigation activities could provide a key component in the proposed income-generating activities. By working with these communities, the project can facilitate the further field-testing of small-scale irrigation strategies and practices, as well as knowledge transfer methods and use of the proposed small-scale irrigation database. At the same time, the SPA project’s focus on biodiversity conservation strategies in this and other areas could provide valuable lessons learned for this project.

12. Similar cooperative relationships will be established with at least two other GEF projects in Senegal. The UNDP/WB/GEF Senegal River Basin project would be a major partner in ensuring that the lessons learnt on small scale irrigation are replicated throughout the Basin. Furthermore, cooperation and exchanges with the newly approved WB/GEF project for Coastal Zone management will help to benefit communities practicing irrigation on coastal zones.

#### Threats and Underlying Root Causes

13. In Africa, an estimated 72% of the arable land, and 31% of the pastoral land, is degraded. Land degradation is particularly acute in dryland regions of the continent, where marginal lands are being converted to agriculture and intensive grazing activities continue to spread to new, unsuitable areas. Agriculture and grazing on marginal lands lead to increased soil runoff, sedimentation, and nutrient depletion, resulting in declines in water quality and quantity and agricultural productivity. Salinization destroys productive farmland and reduces water quality in lakes and rivers, while more frequent and severe flooding and increased landslides direct threaten human safety and livelihoods. In many areas, the transformation of landscapes has progressed so far that local micro-climates have changed, further intensifying the severity and effects of drought.

14. The effects of land degradation on agricultural and grazing lands extend beyond these areas and their human populations to the surrounding natural landscape. As land productivity declines, local populations clear additional land for agricultural use and increasingly rely on fuelwood for energy, resulting in high rates of deforestation. In the Bakel region, critical forest habitat is concentrated along the Senegal river, an area that has been particularly affected by land clearance. This loss of native habitat directly threatens globally significant biodiversity, and also contributes to further erosion and runoff problems, and in some areas lowers ground water levels.

15. Underlying these direct threats to dryland ecosystems are several economic, social, and political factors that inhibit sustainable resource management in the dryland regions of Senegal. Many natural resource management activities continue to be based on inappropriate models such as short fallow rotations, soil mining, planting on steep slopes, and intensive grazing, all of which reduce soil organic matter and the overall productive capacity of the land. Development and dissemination of improved natural resource management strategies designed to address local conditions is constrained by insufficient resources, unsupportive institutional priorities, and poor technical capacities. In addition, policies and laws for water and soil resource use and rights are not well developed and frequently contradictory. Finally, poverty and food insecurity are an important driver in pushing local inhabitants to abandon traditional restraints on resource use in favor of maximizing short-term exploitation of local ecosystems.

#### Carbon sequestration assessment

16. A new and interesting challenge for SLM is to show its relevance and potential in Carbon sequestration. Well-managed drylands represent not only a productive land and a healthy ecosystem, but also a means for Carbon sequestration. However, Carbon assessments of drylands are infrequent and there is actually a lack of tools for Carbon monitoring in SLM and micro-irrigation practices. A recent GEF project, the **Carbon Benefits Project (CBP)**, is meant to provide modeling, measurement and monitoring tools for Carbon sequestration and emissions-reduction. It will be implemented by UNEP and the World Bank and its goal is to precisely support GEF projects, such as the current one, with tools and protocols for better baseline assessment and monitoring around Carbon. The CBP will thus equip the project with the means to assess Carbon dimensions of SLM interventions.

## **2.- Strategy**

17. Despite these advantages, sustainable land and water management has been hampered by a lack of tools for gathering and transferring knowledge, and by socio-political and biophysical constraints to small-scale irrigation in many countries. The proposed project will help **develop tools for promoting successful land and water management techniques, identify best practices**, as well as identify strategies for overcoming constraints to implementation and replication.

18. Underlying the project strategy is the belief that sustainable small-scale irrigation (irrigation system using less water and fertilizer) can act as a catalyst that prevents land degradation, improve economic conditions, and maintain and improve ecosystem health, integrity, functions

and services, improve groundwater resources and conserve biodiversity. Environmentally sustainable small-scale irrigation activities such as micro-catchment systems, water harvesting, and check dams will allow local inhabitants to capture more rainfall, while small-scale pumping systems will provide river water to lands that were formally used for recession flooding but no longer are flooded. For example, degraded crusty soils (e.g., Karan karan soils) can be made productive through simple water conservation techniques, incised drainage-ways can be plugged in order to restore flooding to the flood plain and thus the natural irrigation provided by flooding to crops grown on these soils. Productivity and conservation of soil resources on irrigated lands will be enhanced by improved technologies (e.g. including drip irrigation), improved distribution and storage efficiency that will reduce evaporation and runoff, and more diverse irrigated landscapes that mimic the resource conservation properties of natural areas (e.g. tree planting, intercropping). Resulting improvements in crop yields, and conservation of soil and water resources, will improve local incomes and reduce land degradation and the need to exploit marginal lands in an unsustainable manner.

19. Some successful projects in micro irrigation are already available in Senegal and will provide the basis for a quick start; they include CECI/PAEP micro-irrigation kit, African Market Garden /ICRISAT approach, ENDA-lead land use planning experiment in Sebikotane, and the PAPIL experiment. The project will use participatory approaches to involve stakeholders at national, regional and local levels. Also soil carbon, as a useful indicator for ecosystem health, will be monitored and results will contribute to the international ongoing negotiations on climate change, adaptation and soil carbon sequestration.

20. The project will inform and train farmers and NRM stakeholders on sustainable land and water management, implementing pilot demonstrations in the Bakel department. It will also gather, systematize, and disseminate information on small-scale dryland irrigation systems and related SLM best practices. The Bakel territorial department consists of 5 municipalities ("arrondissements") and 13 rural districts ("comunautés rurales"), with a population of about 200,000 inhabitants. Dissemination will be a core practice, reaching out to rural communities elsewhere in Senegal to improve their capacity to manage scarce and fragile resources, particularly water and soil. The project is premised on the contention that the use of innovative water management practices, particularly small-scale irrigation activities, embedded within the context of more effective community-based land use planning and decentralization, will provide results that overcome the difficulties outlined above and do so in for the long term. Furthermore, the use of such practices to inform the development of national resource management strategies in Senegal will prove invaluable to other African nations where small-scale irrigation can contribute to improved integrated ecosystem management, and could result in the future execution of similar projects in other countries. Some successful projects in micro irrigation are already available in Senegal and will provide the basis for a quick start; they include: CECI/PAEP micro-irrigation kit, African Market Garden /ICRISAT approach, ENDA-lead land use planning experiment in Sebikotane, and the PAPIL experiment.

21. The **goal** of the project is to contribute to sustainable land management in order to maintain and improve ecosystem health, stability, integrity, functions and services, and at the same time support sustainable livelihoods in Senegal. The **objective** is to demonstrate and replicate



innovative, indigenous and sustainable small-scale irrigation practices within a context of integrated land use planning.

22. The Project is organized in **3 components**: 1.- Capacity building; 2.- Investment in micro-irrigation and SLM; and 3.- Learning, evaluation and adaptive management. Section II later on contains full project description details: outcomes, activities, deliverables, indicators and related M&E elements, in the form of two elaborated matrices: a *Strategic Results Framework* (II-1) and a Project's *Logical Framework, Outputs and Activities* (II-2). Section III provides a detailed budget, including co-financing support and tentative yearly plan of activities and disbursements. Next there follows the project management arrangements and the M&E dimensions of the project.

23. The project expects to reach some **global environmental benefits**. In particular, the successful implementation of this project will promote the ecological and productive sustainability of drylands, building a productive system that is more sustainable and consistent with the ecological health of drylands. The main global environmental benefit will be to improving water-use efficiency and reducing soil erosion in micro-catchments under small-scale irrigation. Thus the project will provide an environmentally sound irrigation alternative to large-scale irrigation practices, which are often promoted at the expense of accelerated land degradation and waste use of scarce water resources in marginal agricultural areas. The project will develop environmentally sound production systems in the drylands of Senegal that respond to the urgent livelihoods needs of the population while reducing pressure on some lands that have ecological value. The practices experimented in the Bakel department and its rural districts will provide national governmental and non-governmental stakeholders with a tested model for SLM and micro-irrigation planning ready for scaling up in future interventions elsewhere. Finally, the project will help developing a monitoring methodology and a baseline for Carbon sequestration. This will start building a system for monitoring the potential benefits of carbon sequestration in dryland regions by small-scale irrigation and SLM practices. This outcome will be done in concert with the GEF's Carbon Benefits Project, which aims at providing modeling, measurement and monitoring tools for Carbon (assessing stocks, sequestration and emissions-reduction).

### **3.- Management arrangements**

24. The project will be implemented through the **NGO execution modality**. The proposed non-governmental organization is ENDA, an international NGO working in Natural Resource Management for more than 30 years in Senegal. It is part of the global network LEAD (Leadership for Environment and Development), which encompasses many organizations and initiatives that are promoting sustainable development. ENDA currently coordinates the LEAD Network for the Francophone Africa region. Project management will thus be the responsibility of ENDA and broadly of the LEAD/ENDA partnership. The Government, in its endorsement letter, agreed with this operational modality. UNDP will provide technical assistance and will ensure monitoring and evaluation jointly with ENDA.

25. A Project Steering Committee will be created, with oversight and coordination responsibilities. The Steering Committee will be formed principally of representatives from

Government, as well as from the implementing agency (LEAD/ENDA), from co-financing partners, from UNDP and, as relevant, from NGOs and organizations of beneficiaries. The Steering Committee will provide oversight to ENDA, and their implementation partners; will facilitate the coordination of activities among project partners and with outside institutions, and will manage the monitoring and evaluation of the project, including review of annual progress reports. ENDA will put in place a Project Management Unit in Dakar with a Project Manager, and a financial assistant; a Chief Technical adviser located in the Bakel area will ensure management and technical assistance for the field activities (investments, social mobilization, training activities, local planning).

26. The World Bank-supported ANCAR project will provide local farmers with technical assistance, training, and follow-up for the trials. The AFDB-supported PAPIL project will support in the case studies and lessons learned to be investigated, and investments in dams to secure water for irrigation. Collaboration with the French Development Agency-supported program to decentralization and local development will facilitate the integration of the local community based land use plans in the local development plans. The hydro agricultural project of Bakel/SAED, funded by the Kuwaiti Fund, will also complete the local investments and technical assistance framework at community-level. The project will complement the efforts of a regional project on Climate Change Adaptation local strategies (funded by DFID) implemented by ENDA in the Bakel region, in providing opportunities to implement community Adaptation Plans. The CSE partner (Centre de Suivi Écologique) will provide maps, based on satellite imagery, as planning tools for the baseline analysis, the local planning activities and the ecological monitoring and evaluation. This Center is also experimented for land base carbon estimation. The CILSS will help to collect regional experience and to disseminate the results..

27. In order to accord proper acknowledgement to GEF for providing funding, a GEF should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF. The UNDP logo should be more prominent and separated from the GEF logo if possible, as UN visibility is important for security purposes.

#### **4.- Monitoring and Evaluation Plan and Budget**

28. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and UNDP's Country Office (UNDP-CO) with support from UNDP's Environment and Energy (EEG) team at regional level (which is based precisely in Dakar). The project's Results Framework matrix (Section 2) provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis on which the project's Monitoring and Evaluation system will be built.

29. This section outlines the principal components of the Monitoring and Evaluation Plan. Indicative cost estimates related to M&E activities are compiled in Section IV-4 later on. The project's Monitoring and Evaluation Plan will be discussed and finalized at the Project's

Inception Workshop following a collective fine-tuning of indicators, means of verification, and the full definition of project staff's M&E responsibilities.

30. **Project Inception**. An Inception Workshop (IW) will be conducted with the project team, relevant government counterparts, co-financing partners, the UNDP-CO and a representation from the UNDP-GEF Regional Coordinating Unit. A fundamental objective of this Inception Workshop will be to assist the project team to understand and take ownership of the project's goals and objectives, as well as finalize preparation of the project's first annual work plan on the basis of the project's result framework matrix. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

31. Additionally, the purpose and objective of the IW will be to: (i) introduce project staff with the UNDP-GEF expanded team which will support the project during its implementation, namely the CO and the Regional Coordinating Unit staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO staff vis-à-vis the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget rephasings.

32. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be examined in order to clarify, for all, each party's responsibilities during the project's implementation phase.

33. An Inception Report will be produced immediately after the IW to compile the results and agreements reached, including: (i) refining of roles and responsibilities of the project team, the implementing agency and the Steering Committee; (ii) the core M&E elements such as indicators and means of verification, including particularly guidance for the study that will define baseline and quantitative indicators to measure impact on Component 2; and (iii) the annual work plan for the first year.

34. **Monitoring responsibilities and events**. A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for Tripartite Reviews, Steering Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities. Day to day monitoring of implementation progress will be the responsibility of the Project Manager based on the project's Annual Work Plan and its indicators. The Project Team will inform the UNDP-CO of any delays or difficulties faced

during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.

35. The Project Manager and UNDP's Regional Advisor for SLM will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the Inception Workshop with support from UNDP-CO and assisted by the UNDP's Regional Coordinating Unit. Targets and indicators will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan.

36. Measurement of impact indicators related to global benefits will occur according to the schedules defined in the Inception Workshop. The measurement of indicators will be undertaken through subcontracts or retainers with relevant institutions, through specific studies that are to form part of the projects activities (e.g. measurement carbon benefits from best SLM practices) or periodic sampling such as with sedimentation. This exercise will be carry out in coordination with the regional SIP monitoring and evaluation team and indicators.

37. Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the project, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

38. UNDP's CO will conduct yearly visits to field sites to assess project progress. A Field Visit Report will be prepared by the CO and circulated, no less than one month after the visit, to the project team, to all SC members, and to UNDP-GEF team.

39. **Annual Monitoring.** This will occur through the Tripartite Review (TPR). This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to Tripartite Review (TPR) at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The Government will prepare an Annual Project Report (APR) and submit it to UNDP-CO and the UNDP-GEF regional office at least two weeks prior to the TPR for review and comments.

40. The APR will be used as one of the basic documents for discussions in the TPR meeting. The project proponent will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The Government also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary. The TPR has the authority to suspend disbursement if project performance benchmarks are not met.

41. **Terminal Tripartite Review (TTR).** The terminal tripartite review is held in the last month of project operations. The Government is responsible for preparing the Terminal Report and submitting it to UNDP's CO and RCU. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The terminal tripartite review considers the implementation of the project as a whole,

paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental goals. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation or formulation.

42. **Project Monitoring Reporting**. The Project Coordinator will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Among them, items (a) through (d) are mandatory and strictly related to monitoring, while (e) and (f) are optional and depend on the type of project and its implementation.

(a) *Inception Report (IR)*

43. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed Annual Work Plan, divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include tentative dates of specific field visits, support missions from UNDP's CO, as well as time-frames for meetings of the project's decision making structures. The report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame.

44. The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project-related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

45. When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, UNDP's CO and RCU will be given the opportunity to review the document.

(b) *Annual Project Report (APR)*

46. The APR is a UNDP requirement and part of UNDP's CO oversight, monitoring and project management. It is a self-assessment report by project management to the CO and provides input to the country office reporting process and the ROAR, as well as forming a key input to the Tripartite Project Review. An APR will be prepared on an annual basis prior to the Tripartite Project Review, to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

47. The format of the APR is flexible but should include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- AWP, CAE and other expenditure reports (ERP generated)
- Lessons learned
- Clear recommendations for addressing key problems in lack of progress or to improve implementation

(c) *Quarterly Progress Reports*

48. The project team will provide UNDP-CO quarterly with short reports outlining main updates in project progress.

(d) *Project Terminal Report*

49. During the last three months of the project, the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met or not achieved, structures and systems implemented, etc. It will represent the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

(e) *Technical and thematic reports* (project specific - optional)

50. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. Technical Reports may be prepared by external consultants and should be specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.
51. As and when called for by UNDP, the project team will prepare specific thematic reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered during implementation. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

(f) *Project Publications* (project specific- optional)

52. Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific texts of practitioner's documents. It is anticipated that the project will produce a number of these documents as part of its activities.
53. **Independent evaluations**. The project will be subjected to at least two independent external evaluations as follows: a Mid-Term Review and a Final Evaluation.
54. An independent **Mid-Term Review** (MTR) will take place around mid of project implementation. It will determine progress made towards the achievement of outcomes and will identify course of corrections, if needed. The MTR will assess as follows: (i) effectiveness, efficiency and timeliness of project implementation; (ii) issues requiring decisions and actions; and (iii) initial lessons learned. This review will provide recommendations for enhanced implementation during the remainder of the project. The organization, terms of reference and timing of the MTR will be prepared by the project team and cleared by UNDP (CO and RCU).
55. An independent **Final Evaluation** will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities and policy mainstreaming. The Terms of Reference for this evaluation will be prepared by the project team and UNDP's CO, based on guidance from UNDP's RCU.
56. **Learning and knowledge dissemination**. The project has an intrinsic feature of producing and disseminating knowledge and best practices on SLM. This will be conducted through existing information sharing networks and forums and other means as identified in the course of implementation. In addition, the project will participate in, share results with the TerrAfrica partnership. The project will also participate, as relevant and appropriate, in UNDP/GEF sponsored networks and events, and in technical (SLM practitioners), scientific, policy and/or any other networks, which may benefit the project implementation through lessons learned.
57. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects, whether in Senegal or in other countries of the region facing similar challenges. The identification and analysis of lessons learned is an ongoing process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP/GEF shall assist the project team in the categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities. ENDA updated database will play a major role in results dissemination.
58. **Audit clause**. The Government will provide UNDP's Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of GEF and UNDP funds according to the established procedures set out in the

Programming and Finance manuals. The Audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

## **5.- Legal Context**

59. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Senegal and the United Nations Development Programme, signed by the parties on [date]. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

60. The UNDP Resident Representative in Senegal is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- Revision of, or addition to, any of the annexes to the Project Document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; *and*
- Inclusion of additional annexes and attachments only as set out here in this Project Document.



## SECTION II: STRATEGIC RESULTS FRAMEWORK, SRF AND GEF INCREMENT

The two project analysis frameworks are indicative and may be fine-tuned following the inception report and the baseline analysis to be done in the first year of the project. In any case, no changes are expected at goal, objective and outcome levels.

### 1.- Strategic Result Framework

Project Strategy	Objectively verifiable indicators			Sources of verification	Assumptions
	Indicator	Baseline value	Target value and date		
<b>Long-term goal:</b> To contribute to sustainable land management in order to maintain and improve ecosystem health, stability, integrity, functions and services, and at the same time support sustainable livelihoods in Senegal.					
<b>Project objective:</b> To demonstrate and replicate innovative, indigenous and sustainable small-scale irrigation practices within a context of integrated land use planning.	Hectare of land brought under sustainable land management.	Zero	An estimated 4,000 ha. of land brought under SLM by end of project	Project M&E reports	Government agencies and other stakeholders will not disregard the advantages of small-scale irrigation. Farmers find financial resources
	Number of individual farmers either become newly involved with sustainable small-scale irrigation or adopt improved practices into their small-scale irrigation systems.	Zero	At least 400 farmers (in 10 rural districts) in Bakel Dept. by year 3		
<b>COMPONENT 1: CAPACITY BUILDING</b>					
<b>Outcome 1.1</b> Enhanced awareness and knowledge about sustainable irrigation practices at national level	A computerized database of successful small-scale irrigation initiatives in arid regions worldwide, including information on model irrigators for successful initiative in Senegal.	No data base	Data base available by end of first year of project.	Project annual report; Community-based land use plans	Detailed and analytical information is available in the country
	Number of community based integrated land use plans in the selected sites.	To be determined after the project's baseline studies	At least 10 community-based plans integrate best SLM and/or small-irrigation practices		
<b>Outcome 1.2</b> Institutional capacities for SLM strengthened in the Bakel department	Nb of trained leaders and local SLM stakeholders	Few leaders aware for SLM	At least 200 leaders/local stakeholders are trained	Project annual report; Institutional & political review of the irrigation sector; Beneficiaries' surveys	
	Government policies adopted that provide an enabling environment for a viable, sustainable small-scale irrigation sector	To be determined with the policy review	At least one government policy incorporates revisions related to sustainable small scale irrigation by year 3		

Project Strategy	Objectively verifiable indicators			Sources of verification	Assumptions
	Indicator	Baseline value	Target value and date		
<b>Outcome 1.3</b> Potential for Carbon sequestration from SLM is better understood and documented, and contributes to int'l negotiations	Carbon sequestration methodologies	No assessment & methodology available or done for Carbon sequestration by ILUP	At least one methodology is developed at national/local level and one Carbon assessment is done and used for international negotiation	Studies and technical assistance on carbon sequestration	
<b>COMPONENT 2: INVESTMENTS IN MICRO IRRIGATION</b>					
<b>Outcome 2</b> Models of sustainable micro irrigation systems are implemented in the Bakel department	Number of farmers participating in pilot field practices/investments on micro-irrigation  Crop productivity increase in pilot sites  Water efficiency increase in pilot sites (yield / water outage)	No fields test installed; baseline to be defined and assessed at project's onset	At least 400 new units are installed in three years  At least 30% crop productivity increase in pilot sites. [water efficiency increase's target to be defined at project onset]	Project annual report  Beneficiaries' surveys	Conflicts among farmers due to competition over lands benefitting from micro irrigation controlled
<b>COMPONENT 3: LEARNING, EVALUATION AND ADAPTATIVE MANAGEMENT</b>					
<b>Outcome 3.1</b> Project management is efficient	Project delivery rate		Project management delivery rate averages 70% per year	Project annual report Government & UNDP reports	Projects partners are fully involved and can play their role
<b>Outcome 3.2</b> Enhanced awareness at national and regional levels of the potential of micro-irrigation practices to generate global environmental and socio-economic benefits	A set of field-tested knowledge-transfer methods and tools for up-scaling micro and small scale SLM practices throughout Senegal and sub region  Number of stakeholders in the Bakel region participating in knowledge-transfer efforts	Few tools available  Zero	At least four major publications on new methods, tools and/or best practices by end of the project  At least 50 farmers participating in disseminating activities and/or field trips at the end of the project	Project's publications  Field trip and project reports	

## 2.- Project Logical Framework, Outputs and Activities

<b>COMPONENT 1: CAPACITY BUILDING</b>	
<b>Outcome 1.1 : Sustainable irrigation practices are better known and more fully integrated into local planning</b>	<b>Products to be delivered</b>
<p><i>1.1.1. A regularly updated, comprehensive, and accessible database of successful micro irrigation and ILUP strategies in the sub-region and the world</i></p> <p><b>Activities:</b></p> <p>1.1.1.1 Gathering and review of relevant information.</p> <p>1.1.1.2 Identification of common themes that can be organized to construct the database and identification of key attribute.</p> <p>1.1.1.3 Database design and construction for micro irrigation and ILUP (Microsoft Access)</p> <p>1.1.1.4 Database installation (location, web hosting and functioning)</p> <p>1.1.1.5 Database users training</p>	<ul style="list-style-type: none"> <li>▪ Annotated bibliography of available information.</li> <li>▪ Description of the final small-scale irrigation and ILUP database with user guide</li> <li>▪ A computerized database of model irrigators, irrigation stakeholders, and small-scale irrigation successes, with mechanisms for maintaining and updating database over long term</li> </ul>
<p><i>1.1.2 Document detailing best-fit SLM micro and small-scale irrigation practices, identified through participatory process</i></p> <p><b>Activities:</b></p> <p>1.1.2.1 Review of the Senegal irrigation sector</p> <p>1.1.2.2 Identification of case studies</p> <p>1.1.2.3 Participatory survey on small-scale irrigation and farmers innovators in Senegal (4 workshops)</p> <p>1.1.2.4 Document on best practices publication</p>	<ul style="list-style-type: none"> <li>▪ Irrigation sector review</li> <li>▪ Case studies identified of successful small-scale irrigation practices and farmer innovation.</li> <li>▪ Document detailing SLM and small scale irrigation best strategies and practices</li> </ul>
<p><i>1.1.3 Public and private sector stakeholders in 10 “local communities” in the Department of Bakel aware of, trained in, and using effective small-scale irrigation management approaches, methods, and tools, within the context of Integrated Land Use Planning (ILUP)</i></p> <p><b>Activities:</b></p> <p>1.1.3.1 Definition of strategies to overcome knowledge-transfer constraints</p> <p>1.1.3.2 National workshop on knowledge transfer in micro irrigation</p> <p>1.1.3.3 Tools development</p> <p>1.1.3.4 Local stakeholders training sessions in the Bakel local communities on small-scale irrigation, integrated land use planning, and environmental conservation at community and watershed levels in the field sites</p> <p>1.1.3.5 Education program (schools, media, ...)</p> <p>1.1.3.6 Leader training sessions on integrated land use planning for CBO leaders and local government officials</p>	<ul style="list-style-type: none"> <li>▪ Documents and workshop report on knowledge transfer for micro irrigation and ILUP</li> <li>▪ Tools developed for technology transfer and Educational program (maps, guidelines in local languages)</li> <li>▪ Training reports</li> <li>▪ Local CBO land use Plans</li> </ul>

<p><b>Outcome 1.2 Institutional, community and individual capacities for SLM strengthened</b></p>	
<p><i>1.2. Leaders aware of the necessary changes to improve SLM and small scale irrigation and taking actions</i>  <b>Activities:</b>  1.2.1 National analysis of the legal, institutional and policy opportunities and constraints associated with current irrigation methods and micro irrigation  1.2.2 National policy workshop  1.2.3 Communication strategy for national leaders</p>	<ul style="list-style-type: none"> <li>▪ Report on legal, institutional, and policy framework providing enabling environment for viable small-scale irrigation sector</li> <li>▪ Communication strategy for the national level</li> </ul>
<p><b>Outcome 1.3 Land based carbon from SLM best practices is better known and contribute to international negotiations</b></p>	
<p><i>1.3.1 Baseline studies and monitoring methodologies are available for carbon sequestration evaluation and monitoring</i>  <b>Activities:</b>  1.3.1.1 Baseline study on pilot sites on land use, forest cover and carbon sequestration potential of various landscapes within the project site.  1.3.1.2 Test for a monitoring methodology  1.3.1.3 Targeted dissemination strategy to potential users</p>	<ul style="list-style-type: none"> <li>▪ Results and dissemination of baseline studies and monitoring methodology</li> <li>▪ Nb of initiatives using data for international negotiation or carbon market</li> </ul>
<p><b>COMPONENT 2: INVESTMENT IN MICRO IRRIGATION AND SLM</b></p>	
<p><b>Outcome 2: Models of sustainable micro irrigation systems are implemented in the Bakel region</b></p>	
<p><i>2. Small scale irrigation best practices experimented in 10 local communities of the Bakel region</i>  <b>Activities:</b>  2.1 Compilation and dissemination of baseline information on natural resources and human activities at the pilot sites in the Bakel region with a particular emphasis on current small-scale irrigation practices  2.2 Identification of appropriate small-scale irrigation strategies for the Bakel Region  2.3 Development of mechanisms for effective stakeholder participation and negotiations at field sites, including community workshops, NGO networks, etc.  2.4 Pilot site level participative workshops on project methods and goals and for demonstrations partner identification  2.5 Implementation of mechanisms for conflict prevention and resolution before the on-the-ground irrigation activities.  2.6 Partners training session on micro irrigation and ILUP and trials execution modalities  2.7 Field installation of micro irrigation units  2.8 Technical assistance and follow up for field trials  2.9 Support farmer-to-farmer knowledge exchange  2.10 Reports on field trials</p>	<ul style="list-style-type: none"> <li>▪ Baseline information report on natural resources and human activities available for all sites, combining scientific, socio-economic, and local data and knowledge.</li> <li>▪ Reports on participative workshops completed; community-driven process established, and working partnerships and agreements made</li> <li>▪ Reports on micro irrigation units installed (400 targeted) and the nb of ha. on SLM best practices with socio-economic and ecologic performances on SLM of the field trials</li> <li>▪ Reports on field trip</li> </ul>

<b>COMPONENT 3: LEARNING, EVALUATION AND ADAPTATIVE MANAGEMENT</b>	
<b>Outcome 3.1 Project management is efficient</b>	
<p><i>3.1 Efficient management and monitoring and evaluation system integrating lessons learned</i></p> <p><b>Activities:</b></p> <p>3.1 Coordination activities with partners</p> <p>3.2 Monitoring and evaluation methodology development</p> <p>3.2 Baseline study related to project indicators</p> <p>3.3 Monitoring activities (see Monitoring Plan)</p> <p>3.4 Financial and human resources management</p>	<ul style="list-style-type: none"> <li>▪ Reports and annual work plans</li> <li>▪ Midterm evaluation report and audit</li> <li>▪ Targeted reports on environmental indicators</li> </ul>
<b>Outcome 3.2 Project results are known and are improving the national and sub regional context for micro irrigation and SLM</b>	
<p><i>3.2 A dissemination strategy is implemented using a set of field-tested knowledge-transfer methods and tools for up-scaling micro and small scale SLM practices throughout Senegal and sub-region</i></p> <p><b>Activities:</b></p> <p>3.2.1 Dissemination strategy design within the SIP context</p> <p>3.2.2 Support to Farmer-to-Farmer knowledge exchange, intra- and inter-site exchanges, and partnership development (local and regional stakeholders)</p> <p>3.2.3 Dissemination strategy implementation (website, LEAD network activities, ...)</p> <p>3.2.4 Dissemination strategy follow up</p>	<ul style="list-style-type: none"> <li>▪ Dissemination strategy, project tools and publications</li> <li>▪ Contributions to improve institutional, and political national and sub-regional context for SLM and small-scale irrigation sector</li> </ul>

### SECTION III: TOTAL BUDGET AND WORKPLAN

<b>Award ID:</b>	Tbd
<b>Award Title:</b>	Tbd
<b>Business Unit:</b>	UNDP / EEG
<b>Project Title:</b>	SENEGAL-SIP: Innovations in Micro Irrigation for Dryland Farmers
<b>Project ID:</b>	PIMS No 2120
<b>Implementing Partner (Executing Agency)</b>	<b>ENDA/LEAD</b>

*Amounts in USD*

GEF Outcome / Atlas Activity	Fund ID	Atlas budgetary account code	Atlas Budget description	Year 1	Year 2	Year 3	GEF funding	Co-financing sources	TOTAL	Comments	
<b>OUTCOME 1.1</b> Sustainable irrigation practices are better known and more fully integrated into local planning	62000	72800	Info Tech Eq	10 000	0	0	<b>10 000</b>	0	10 000	ICT Equipment	
			72100	Cont Serv Com	30 000	13 000	0	<b>43 000</b>	30 000	73 000	Information collection
			72100	Cont Serv Com	5 000	0	0	<b>5 000</b>	14 000	19 000	Data base development
			72400	Com Audio Eq	0	0	0	<b>0</b>	2 100	2 100	Web Hosting
			71400	Cont Ser Ind	0	0	0	<b>0</b>	16 400	16 400	Database up date
			72100	Cont Serv Com	5 000	0	0	<b>5 000</b>	13 500	18 500	Users Training
			71600	Travel	5000	5000	5000	<b>15 000</b>	15 000	30 000	Local Travel
			74500	Miscellaneous	2 000	2 000	1 000	<b>5 000</b>	10 000	15 000	Miscellaneous
			72100	Cont Serv Com	5 000	5 000	5 000	<b>15 000</b>	5 000	20 000	Participatory research
			71400	Cont Ser Ind	0	0	0	<b>0</b>	32 000	32 000	Publication
			74200	Audio Print Prod	3 000	2 000	2 000	<b>7 000</b>	8 000	15 000	Editing and translation
			74200	Audio Print Prod	6 000	8 000	6 000	<b>20 000</b>	10 000	30 000	Printing & distribution
			71600	Travel	2 000	2 000	1 000	<b>5 000</b>	10 000	15 000	Local travel
			72100	Cont Serv Com	0	0	0	<b>0</b>	12 000	12 000	Strategy development
			72100	Cont Serv Com	0	0	0	<b>0</b>	3 000	3 000	Training manual
			72100	Cont Serv Com	5 000	5 000	5 000	<b>15 000</b>	4 000	19 000	Stakeholder training
		72100	Cont Serv Com	0	10 000	0	<b>10 000</b>	5 000	15 000	National workshop	
		72100	Cont Serv Com	0	10 000	0	<b>10 000</b>	5 000	15 000	Communication strategy	
		72100	Cont Serv Com	0	10 000	0	<b>10 000</b>	15 000	25 000	Leader training	
<b>OUTCOME 1.2</b> Institutional, capacities for SLM strengthened	62000	74200	Audio Print Pod	3 000	3 000	2 000	<b>8 000</b>	10 000	18 000	Advocacy campaign	
			72100	Cont Ser Ind	3 000	4 000	3 000	<b>10 000</b>	10 000	20 000	Information workshop
			71600	Travel	0	0	4 000	<b>4 000</b>	11 000	15 000	Decision maker travel
			71300	Local consultants	2 000	3 000	3 000	<b>8 000</b>	20 000	28 000	Position paper
			71600	Travel	2 000	1 000	1 000	<b>4 000</b>	14 000	18 000	Local travel
<b>OUTCOME 1.3</b> Land based carbon from SLM practices better known and into int'l negotiations	62000	72800	Inf Tch Equip	5 000	0	0	<b>5 000</b>	3 000	8 000	Satellite imagery	
			72500	Supplies	0	0	0	<b>0</b>	3 000	3 000	Office supplies
			72100	Count Serv Com	0	5 000	5 000	<b>10 000</b>	2 000	12 000	Lab Analysis
			72100	Travel	1 000	1 000	0	<b>2 000</b>	8 000	10 000	Local travel
			72300	Local consultant	1 500		1 500	<b>3 000</b>	4 000	7 000	Local consultant
<b>subtotal</b>							<b>229,000</b>	295 000	524 000		

GEF Outcome / Atlas Activity	Fund ID	Atlas budgetary account code	Atlas Budget description	Year 1	Year 2	Year 3	GEF funding	Co-financing sources	TOTAL	Comments
<b>OUTCOME 2</b> Models of sustainable micro irrigation systems are implemented in the Bakel region	62000	72100	Cont Serv Com	3 000	6 000	3 000	<b>12 000</b>	25 000	37 000	Soil preparation
		72100	Cont Serv Com	0	0	0	<b>0</b>	6 000	6 000	Farmers training
		72300	Mat & Goods	30 000	70 000	10 000	<b>110 000</b>	50 000	160 000	Irrigation equipment
		72100	Cont Serv Com	50 000	200 000	40 000	<b>290 000</b>	200 000	490 000	Hydraulic Work
		72300	Mat & Goods	15 000	26 000	15 000	<b>56 000</b>	10 000	66 000	Agricultural inputs
		71600	Travel	8 000	7 000	5 000	<b>20 000</b>	0	20 000	Local travel
		74500	Miscellaneous	1 000	1 000	0	<b>2 000</b>	5 000	5 000	Miscellaneous
<b>subtotal</b>						<b>490,000</b>	<b>296 000</b>	<b>786 000</b>		
<b>OUTCOME 3.1</b> Monitoring and adaptive management of the project	62000	71100	ALD Emp Cost	17 500	17 500	17 500	<b>52 500</b>	52 500	105 000	Project Manager
		71300	Local consultants	2 000	2 000	1 000	<b>5 000</b>	7 000	12 000	Local consultant
		72100	Cont Serv Com	2 500	0	0	<b>2 500</b>	2 000	4 500	Inception workshop
		73100	Rent Maint Prem	0	0	0	<b>0</b>	6 000	6 000	Office rental
		73100	Rent Maint Prem	0	0	0	<b>0</b>	12 000	12 000	Office Utilities
		74200	Audio Print Prod	0	0	0	<b>0</b>	9 300	9 300	Communications (Tel, Int.)
		72200	Equip & Furnit	0	0	0	<b>0</b>	3 200	3 200	Office furniture
		72800	Inf Tch Equip	4 600	0	0	<b>4 600</b>	1 400	6 000	ICT equipment
		72500	Supplies	400	400	400	<b>1 200</b>	3 000	4 200	Office supplies
		72200	Equip & Furnit	8 500	0	0	<b>8 200</b>	0	8 200	02 motorcycles
		73400	Rent Other Equip	0	0	0	<b>0</b>	6 100	6 100	Equipment Maintenance
		71600	Travel	2 000	2 000	1 000	<b>5 000</b>	16 000	21 000	Local travel
		71600	Travel	0	3 000	2 000	<b>5 000</b>	9 500	14 500	International Travel
		74500	Miscellaneous	2 000	3 000	2 000	<b>7 000</b>	5 000	12 000	Miscellaneous
<b>OUTCOME 3.2</b> Project results are known and are improving the national and sub regional context for micro-irrigation and SLM	62000	72100	Cont Serv Com	2 000	15 000	10 000	<b>27 000</b>	25 000	52 000	Local resource center
		71600	Travel	2 431	20 000	15 000	<b>37 431</b>	15 000	52 431	Exchange program
		72100	Cont Serv Com	4 000	3 000	3 000	<b>10 000</b>	20 000	30 000	Information workshop
		74200	Audio Print Prod	1 000	5 000	5 000	<b>11 000</b>	6 000	17 000	TV and radio broadcasting
		72300	Mat & Goods	4 000	4 000	3 000	<b>11 000</b>	10 000	21 000	Agricultural inputs
		71600	Travel	2 500	1 500	1 000	<b>5 000</b>	5 000	10 000	Local Travel
		74500	Miscellaneous	2 000	2 000	2 000	<b>6 000</b>	5 000	11 000	Miscellaneous
<b>subtotal</b>						<b>198 431</b>	<b>219 000</b>	<b>417 431</b>		
<b>TOTAL ( GEF / Co-financing / Overall )</b>							<b>917 431</b>	<b>810 000</b>	<b>1 727 431</b>	

**SIGNATURE PAGE**

NGO: ENDA/LEAD

UNDAF Outcome(s)/Indicator(s):

\_\_\_\_\_

*(Link to UNDAF outcome., If no UNDAF, leave blank)*

Expected Outcome(s)/Indicator (s):

\_\_\_\_\_

*(CP outcomes linked t the SRF/MYFF goal and service line)*

Expected Output(s)/Indicator(s):

\_\_\_\_\_

*(CP outcomes linked t the SRF/MYFF goal and service line)*

Implementing partner:

*(designated institution/Executing agency)*

\_\_\_\_\_

Other Partners:

\_\_\_\_\_

\_\_\_\_\_

Programme Period: _____
Programme Component: _____
Project Title: _____
Project ID: _____
Project Duration: _____
Management Arrangement: _____

Total budget: _____
Allocated resources: _____
• Government _____
• Regular _____
• Other: _____
○ Donor _____
○ Donor _____
○ Donor _____
• In kind contributions _____

**Agreed by Government of Senegal:** \_\_\_\_\_

**Agreed by LEAD/ENDA (implementing agency):** \_\_\_\_\_

**Agreed by UNDP:** \_\_\_\_\_





**UNDP Project Document**  
**UNDP-GEF Medium-Size Project (MSP)**

**Government of Senegal**  
**United Nations Development Program**

**LEAD/FA – ENDA**  
( Leadership for Environment and Development / Francophone Africa –  
Environmental Development Action )

PIMS No 2120: **SIP - Innovations in Micro Irrigation for Dryland Farmers**

**APPENDIX 4**

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## **Draft Terms of Reference for key project staff**

### **3.1.- Project Manager**

**Overall responsibilities:** The Project Manager will be responsible for the implementation of the project, including the mobilization of all project inputs, supervision over project staff, consultants and subcontractors. The PM will manage the Capacity Building for SRM MSP, will be fully accountable to ENDA, UNDP, and to the Steering Committee for satisfactory execution of the entire project. He will be responsible for meeting ENDA obligations under the Project, under the NGO execution modality. The Project Manager will be the head of the Project Management Unit, which will have operational and financial autonomy, including the authority to select and sub-contract specific project activities to consultants and institutions. The PM shall perform a liaison role with government, UNDP, and all stakeholders involved with the project.

#### **Specific duties and Responsibilities**

- Overall management and technical coordination of the project;
- Supervise and coordinate the production of project outputs as per the project document;
- Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects;
- Finalize the ToR for the consultants and subcontractors; coordinate the recruitment and selection of project personnel;
- Supervise and coordinate the work of all project staff, consultants and sub-contractors;
- Work closely with project partners to closely coordinate all the actors involved with achieving Project Outcomes, Outputs and Activities;
- Establish partnerships between the different actors involved in the project, defines the procedures and modus operandi
- Prepare and revise project work and financial plans, as required Government and UNDP;
- Manage procurement of goods and services under UNDP guidelines and oversight of contracts;
- Ensure proper management of funds consistent with UNDP requirements, and budget planning and control;
- Establish project monitoring and reporting; arrange for audit of all project accounts for each fiscal year; and report progress of project to the Steering Committee.
- Prepare and ensure timely submission of quarterly financial consolidated reports, quarterly consolidated progress reports mid-term reports, and other reports as may be required by UNDP;
- Oversee the exchange and sharing of experiences and lessons learned with relevant conservation and development projects nationally and internationally. Disseminate project reports to and respond to queries from concerned stakeholder
- Undertake any other activities that may be assigned by the Steering Committee.

## **Selection Criteria:**

- Post-graduate degree in natural resources management or other relevant academic and profession qualifications with at least 10 years professional experience;
- Proven extensive experience and technical ability to manage a large project and a good technical knowledge in the fields related to SLM, participatory approaches and/or environmental economics;
- Effective interpersonal and negotiation skills proven through successful interactions with all levels of project stakeholder groups, including senior government officials, business executives, farmers and communities;
- Ability to effectively coordinate a complex, multi-stakeholder project;
- Ability to lead, manage and motivate teams of international and local consultants to achieve results;
- Good capacities for strategic thinking and planning;
- Excellent communication skills;
- Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring highly preferable;

## **3.2.- Chief Technical Adviser**

**Overall function:** The Chief Technical Advisor will be based in the field (Bakel Department) and will assist the Project Manager in various implementation duties. In particular, he/she will be responsible for field operations, for mobilization and training of farmers, and for regularly reporting on field activities to the Project Manager.

### **Specific duties and Responsibilities:**

- Assist the Overall management and technical coordination of the project;
- Ensure the technical support of the local team in fields operations and the field trials supervision;
- Assist the irrigation sector review and participatory assessments;
- Supervise and coordinate the production of project outputs as per the project document;
- Assist the tool development;
- Mobilize project inputs in accordance with UNDP procedures for nationally executed projects; ensure proper management of funds consistent with UNDP requirements, and budget planning and control;
- Assist supervision and coordination the work of all project staff consultants and sub-contractors;
- Work closely with project partners to closely coordinate all the actors involved with achieving Project Outcomes, Outputs and Activities;

- Assist the preparation and revision of the project work and financial plans;
- Assist the project monitoring and reporting on selected site and the preparation of the technical and financial quarterly consolidated reports;
- Supervise communication and capacity building activities on selected sites

**Selection Criteria:**

- Post-graduate degree in natural resources management, rural engineering or other relevant academic and profession qualifications with at least 10 years professional experience;
- Proven extensive experience and technical ability to manage a large project and a good technical knowledge in the fields related to SLM, participatory approaches and/or environmental economics;
- Effective interpersonal and negotiation skills proven through successful interactions with all levels of project stakeholder groups, including senior government officials, business executives, farmers and communities;
- Good capacities for strategic thinking and planning;
- Excellent communication skills;
- Knowledge of UNDP project implementation procedures, including procurement, disbursements, and reporting and monitoring preferable;

## Summary of M&E Work Plan and Budget

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding time from project team and UNDP staff</i>	Time frame
Inception Workshop (IW)	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP CO / RCU</li> </ul>	5,000	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP CO</li> </ul>	None	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> <li>▪ Project Coordinator will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members</li> </ul>	To be finalized in Inception Phase and Workshop. Indicative cost: 9,000 XXXX	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> <li>▪ Oversight by Project GEF Technical Advisor and Project Coordinator</li> <li>▪ Measurements by regional field officers and local IAs</li> </ul>	To be determined as part of the Annual Work Plan's preparation. Indicative cost: 6,000 (average US\$ 2,000 per year)	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> <li>▪ Project Team</li> <li>▪ UNDP-CO</li> </ul>	None	Annually
TPR and TPR report	<ul style="list-style-type: none"> <li>▪ Government</li> <li>▪ Project team</li> <li>▪ UNDP CO (RCU to review)</li> </ul>	None	Every year, upon receipt of APR
Steering Committee Meetings	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP CO</li> </ul>	None	Following Project IW and subsequently at least once a year
Periodic status reports	<ul style="list-style-type: none"> <li>▪ Project team</li> </ul>	None	To be determined by Project team and UNDP CO
Mid-Term Review	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP CO / RCU</li> </ul>	10,000	mid-term of implementation
Final External Evaluation	<ul style="list-style-type: none"> <li>▪ Project team,</li> <li>▪ UNDP's CO and RCU</li> <li>▪</li> </ul>	20,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> <li>▪ External Consultant</li> </ul>	None	At least one month before the end of the project
Audit	<ul style="list-style-type: none"> <li>▪ UNDP-CO</li> <li>▪ Project team</li> </ul>	3,000 (average \$1000 per year)	Yearly
Field visits for M&E	<ul style="list-style-type: none"> <li>▪ Government</li> <li>▪ Project team</li> <li>▪ UNDP CO / RCU</li> <li>▪</li> </ul>	9,000 (UNDP travel costs are excluded (they are part of IA fee))	Yearly
TOTAL COST		US\$ 62,000	
<i>(this excludes project team staff time and UNDP staff and travel expenses)</i>			

## Incremental Cost Matrix

*This matrix has been developed as a tentative exercise to show project's relevance.*

	<b>BASELINE (B)</b>	<b>ALTERNATIVE (A)</b>	<b>INCREMENT (A-B)</b>
Domestic Benefits	Numerous programs exist for watershed management in Senegal, but few have been able to prevent desertification, conserve ecosystem health and biodiversity or improve livelihoods because they suffered from narrow approaches, lack of in-country capacity to implement projects, and lack of a participatory approach to land use planning. In addition, knowledge and information that is gained from successful activities remains localized. In this regard, integrated land and water conservation activities, including sustainable small-scale irrigation, are incremental actions that would not otherwise be undertaken under existing conditions, nor would they be shared between sites and stakeholders.	Local benefits expected through increased incomes to farmers participating directly in the project demonstration sites.	The Co-financing increment will focus on ensuring sustainability of actions through enhanced skills on marketing, as well as development of best practices and methodologies for dissemination and knowledge transfer.
Global Benefits	None	Global benefits are expected through demonstrating and replicating sustainable techniques for small scale irrigation by building on a baseline of farmer innovation and best practices in a globally significant watershed.	GEF increment will bring the value added of environmental sustainability to the baseline by lifting barriers and promoting sustainable small-scale irrigation within the context of integrated SLM.
<b>Output 1.1.1:</b> <i>A regularly updated, comprehensive, and accessible database of successful micro irrigation and ILUP strategies in the sub-region and the world</i>	Costs of monitoring & evaluation activities through on-going NRM and development programs.  ADDEL: 90,000 SAED: 196,000 PAPIL: 163,610 ANCAR: 125,000  Total: \$ 574,610	Database of information on effective small-scale irrigation practices within and outside Senegal developed and widely available.         Total: \$834,610	Farmers, resource managers and policy makers using lessons learned from successful projects to guide small-scale irrigation activities in Bakel region and elsewhere in Senegal   GEF: 80,000\$ Co-Financing: 100,000\$  <b>Total: \$180,000</b>
<b>Output 1.1.2:</b> <i>Document detailing best-fit SLM micro and small-scale irrigation practices, identified through participatory process</i>	Cost of water policy implementation and reform.      Total: \$ 0	Experiences of various irrigation and land and water management activities in Senegal compiled and used to guide policy and institutional priorities      Total: \$ 160,000	Best practices and context-driven guidance for land and water management guiding irrigation and conservation practices in dryland areas of Senegal   GEF: 35,000 \$ Co-Financing: 100,000 \$  <b>Total: \$135,000</b>

	<b>BASELINE (B)</b>	<b>ALTERNATIVE (A)</b>	<b>INCREMENT (A-B)</b>
<b>Output 1.1.3:</b> <i>Public and private sector stakeholders in 10 "local communities" in the Department of Bakel aware of, trained in, and using effective small-scale irrigation management approaches, methods, and tools, within the context of ILUP).</i>	Costs of methodological development work and other research towards effective knowledge-transfer SAED: 200,000 ANCAR: 250,000 Total: \$450,000	Effective knowledge-transfer methods among irrigation stakeholders developed, field-tested, and fine tuned  Total: \$795,000	Farmers and resource managers sharing results and best practices for small-scale irrigation in drylands ecosystems  GEF: 60,000 Co-Financing: 40,000 <b>Total: \$100,000</b>
<b>Output 1.2</b> <i>Leaders aware of the necessary changes to improve SLM and small scale irrigation and taking actions</i>	Direct and indirect cost of on-going work for the awareness of decision makers to consider small scale irrigation strategy as important in sustainable natural resources management PAPIL: 130,000 Total: \$100,000	Baseline ecological and socio-economic information gathered, and used to train local stakeholders in effective resource management and conservation practices  Total: \$305,000	Farmers trained in small-scale irrigation and participating in resource management decisions with local authorities and agencies GEF: 34,000 Co-Financing: 75,000 <b>Total: \$109,000</b>
<b>Output 1.3</b> <i>Baseline studies and monitoring methodologies are available for carbon sequestration evaluation and monitoring</i>			
<b>Output 2.</b> <i>Small scale irrigation best practices experimented in 10 local communities of the Bakel region</i>	Cost of NRM demonstration and replication activities conducted through on-going projects SAED: 225,000 ANCAR: 220,000 Total: \$445,000	Small-scale irrigation practices appropriate to dryland agriculture tested and used by local farmers at pilot sites, and lessons learned disseminated among sites and to other potential users (e.g. villages in SPA project)  Total: \$965,000	Local farmers using effective small-scale irrigation practices to reduce land degradation and improve agricultural output and incomes  GEF: 490,000 Co-Financing: 351,000 <b>Total: \$841,000</b>
<b>Output 3.1</b> <i>Efficient management and monitoring and evaluation system integrating lessons learned</i>	Total: \$0	Total: \$350,000	GEF: 91,000 Co-Financing: 109,000 <b>Total: \$200,000</b>
<b>Output 3.2</b> <i>A dissemination strategy is implemented using a set of field-tested knowledge-transfer methods and tools for up-scaling micro and small scale SLM practices throughout Senegal and sub-region</i>	Cost of advocacy programs and policy reforms supportive of alternatives to medium and large-scale irrigation projects PAPIL: 45,000 Total: \$45,000	Current policies and programs for land and water management in Senegal investigated, and sustainable alternatives such as small-scale irrigation promoted among key decision-makers Total: \$205,000	Institutional and policy support within Senegal for small-scale irrigation in appropriate dryland agriculture settings GEF: 100,000 Co-Financing: 100,000 <b>Total: \$200,000</b>
<b>Total Cost</b>	<b>BASELINE: \$1,614,610</b>	<b>ALTERNATIVE: \$ 3,614,610</b>	<b>GEF: 910,000</b> <b>Co-Financing: 895,000</b> <b>TOTAL: 1,805,000</b>

### Note on the carbon sequestration potential of Bakel area

Most of the benefits anticipated from carbon sequestration activities are identical with those expected from improved water and land management practices as well as restoration of degraded lands. They include increased agricultural production, diversification of sources of income and, as a consequence, increased food security and reduced livelihood vulnerability to severe droughts, reduced pressure on risk-prone rain-fed lands as well as on pasture lands, and improved water storage capacity. In addition, certain amounts, although relatively modest, can be expected from carbon trading, if farmers are able to organize themselves as an aggregate appealing to foreign investors (although this is a long-term activity not envisioned during the project's implementation). Given the relatively modest sequestration rate and the low overall amount of carbon that could be stored over a period of 25 years, realistic gains from carbon trading are unlikely to exceed \$15 ha<sup>-1</sup> yr<sup>-1</sup>. Thus, benefits from carbon trading are more likely to occur in the form of improved infrastructure (schools, wells, irrigation schemes and equipment) than individual cash profits for participating farmers.

To date, no reliable data exist that would allow a detailed assessment of the carbon sequestration potential for the Bakel region. However, current estimates of annual C gains, as shown in Table x, provide a general indication of how much carbon could be sequestered in semi-arid regions as a result of specific land use and management practices. Overall, the CO<sub>2</sub>-fixing capacity of semi-arid lands is relatively low, ranging from 0.05 to 0.3t C ha<sup>-1</sup> yr<sup>-1</sup> or from 1.25 to 7.5t C ha<sup>-1</sup> over a period of 25 years.

Technological options for C sequestration in soils in semi-arid environments (25-year period)	C gains (t ha <sup>-1</sup> yr <sup>-1</sup> )
Improved soil fertility management (composting, manure application, mulching, plant residue management)	0.05-0.25
Conservation tillage	0.1-0.2
Restoration of degraded lands (longer-term, improved fallowing, live hedges)	0.05-0.2
Water conservation and management	0.1-0.3
Agricultural intensification	0.1-0.35
Afforestation and tree plantations	0.05-0.2
Rice paddies (irrigation, organic and mineral fertilizer, plant residue management)	0.1

Estimates after Lal (1999), IPCC (2000), and SOCSOM (Sequestration of Carbon in Soil Organic Matter) in Senegal, implemented by EROS Data Center/USGS in collaboration with Colorado State University, University of Arizona, Centre de Suivi Ecologique, and Institut Sénégalais pour les Recherches Agricoles (Petra Tschakert, personal communication)